

1. Consider the following statements with regard to a No-Confidence Motion:

1. It can be moved without specifying the grounds on which the Council of Ministers has lost the confidence of the House.
 2. Before admitting the motion, the Speaker must ascertain whether at least fifty members support its introduction.
 3. It can be directed against the Prime Minister or any individual minister separately.
 4. The first No-Confidence Motion in independent India was moved against the government of Lal Bahadur Shastri.
- How many of the above statements are correct?
- A. Only one
 - B. Only two
 - C. Only three
 - D. All the four

○ Correct Answer : B

○ Answer Justification :

Explanation:

A **No-Confidence Motion (NCM)** is an important parliamentary device in the **Lok Sabha** through which members test whether the **Council of Ministers continues to enjoy the confidence of the majority of the House**, as required under **Article 75(3) of the Constitution**, which provides for the principle of **collective responsibility of the Council of Ministers to the Lok Sabha**.

Statement I is correct. A No-Confidence Motion can be moved **without stating specific reasons or charges** against the government. The motion simply expresses that the House has lost confidence in the Council of Ministers. Unlike a censure motion, which normally specifies the grounds of criticism, an NCM focuses solely on the question of **majority support**.

Statement II is correct. The procedure for moving a No-Confidence Motion is governed by **Rule 198 of the Rules of Procedure and Conduct of Business in Lok Sabha**. After a member gives notice of the motion, the **Speaker asks those supporting the motion to rise in their places**. The motion is admitted only if **at least 50 members support it**. Once admitted, the Speaker must schedule the discussion **within ten days**.

Statement III is incorrect. A No-Confidence Motion cannot be moved against an **individual minister or even the Prime Minister separately**. It is directed against the **Council of Ministers as a whole**, reflecting the constitutional principle of **collective responsibility**.

Statement IV is incorrect. The **first No-Confidence Motion in independent India was moved in 1963 by Acharya J. B. Kripalani against the government of Prime Minister Jawaharlal Nehru**, following the political fallout of the **1962 Sino-Indian War**. It was debated but ultimately defeated.

2. Consider the following statements in respect of delimitation in India:

1. The Delimitation Commission is constituted by the President in consultation with the Election Commission of India.
2. The orders of the Delimitation Commission become operative only after they are approved by Parliament.
3. Delimitation involves readjustment of constituencies for both Houses of Parliament and the State Legislative Assemblies.

◦ Which of the statements given above is/are correct?

- A. I only
- B. II and III only
- C. I and III only
- D. None

◦ Correct Answer : D

◦ **Answer Justification :**

Explanation

Delimitation refers to the **readjustment of boundaries of electoral constituencies** to ensure fair representation of population in legislatures. In India, it is carried out by a **Delimitation Commission established under the Delimitation Act passed by Parliament.**

Statement I is incorrect. Although the **Delimitation Commission is constituted by the President**, the Constitution or the Delimitation Act **does not require consultation with the Election Commission for its constitution.** The Commission generally consists of a **retired Supreme Court judge as Chairperson**, the **Chief Election Commissioner or an Election Commissioner**, and the **State Election Commissioners of the concerned states.** Hence, stating that it is constituted **in consultation with the Election Commission** is inaccurate.

Statement II is incorrect. The **orders of the Delimitation Commission have the force of law once they are published in the Gazette of India.** They **do not require approval of Parliament** and **cannot be challenged in courts**, ensuring finality to the delimitation process.

Statement III is incorrect. Delimitation applies to **Lok Sabha and State Legislative Assembly constituencies only.** It **does not apply to the Rajya Sabha**, since members of the Rajya Sabha are elected indirectly by State Legislative Assemblies and are **not associated with territorial constituencies.**

Therefore, **none of the statements are correct.**

3. Consider the following statements:

Statement I: Fundamental Rights are enforceable primarily against the State.

Statement II: The definition of “State” under Part III extends to authorities created by law within the territory of India or under the control of the Government of India.

Statement III: Bodies performing public functions automatically fall within the scope of “State” for the purposes of Fundamental Rights.

- Which one of the following is correct in respect of the above statements?
 - A. Both Statement II and Statement III are correct and both explain Statement I
 - B. Both Statement II and Statement III are correct but only one explains Statement I
 - C. Only one of the Statements II and III is correct and that explains Statement I
 - D. Neither Statement II nor Statement III is correct
- Correct Answer : C

◦ **Answer Justification :**

Explanation

Fundamental Rights under **Part III of the Constitution** are designed primarily to protect individuals against **arbitrary or excessive exercise of State power**. This reflects the traditional **vertical application of rights**, where the Constitution regulates the relationship between the State and individuals.

Statement I is correct. Fundamental Rights are generally enforceable **against the State**, meaning that actions of government authorities can be challenged if they violate these rights. However, a few provisions such as **Articles 15(2), 17 and 23** extend protection even against certain actions of private individuals.

Statement II is correct. **Article 12 of the Constitution** defines the term “State” for the purposes of Part III. It includes the **Government and Parliament of India, the Government and Legislatures of the States, local authorities, and other authorities within the territory of India or under the control of the Government of India**. This definition determines the institutions whose actions can be tested for violations of Fundamental Rights, thereby explaining Statement I.

Statement III is incorrect. Merely performing a **public function does not automatically make a body part of the “State.”** Courts determine this through judicial tests such as **deep and pervasive government control, financial dependence, and functional integration with the government**, developed in cases like **Ajay Hasia (1981)** and **Pradeep Kumar Biswas (2002)**.

Hence, **only Statement II is correct and it explains Statement I.**

4. Which of the following statements are correct?

1. The Chief Justice of India is the highest Administrative Officer of the Supreme Court of India.

2. The administrative powers for determining the work structure of the Supreme Court and its Registry are exclusively vested in the Chief Justice of India.
3. A person who has been a Judge of the Supreme Court of India can practice after retirement only in the Supreme Court of India and not in any other court within India.
4. A designated Senior Advocate of the Supreme Court of India is not entitled to appear in the Supreme Court of India without an Advocate-on-Record.

◦ Select the answer using the codes given below:

- A. 1 and 2 only
- B. 1, 2 and 3
- C. 3 and 4 only
- D. 2 and 4 only

◦ Correct Answer : D

◦ **Answer Justification :**

Explanation

Statement 1 is incorrect- The **Chief Justice of India (CJI)** is the **head of the Indian judiciary and the Supreme Court**, but the phrase “**highest Administrative Officer of the Supreme Court**” is not a constitutionally recognised designation. Administrative functions of the Court are exercised through the **Supreme Court Registry headed by the Secretary General**, although under the overall authority of the Court.

Statement 2 is correct- The **Chief Justice of India has exclusive administrative authority over the functioning of the Supreme Court**, including **allocation of cases, constitution of benches, and determining the work structure of the Court and its Registry**. This flows from the CJI’s position as “**Master of the Roster**”.

Statement 3 is incorrect- Under **Article 124(7) of the Constitution**, a person who has held office as a **Judge of the Supreme Court cannot plead or act in any court or before any authority within the territory of India** after retirement. Therefore, they **cannot practice even in the Supreme Court**.

Statement 4 is correct- Under the **Supreme Court Rules**, a **Senior Advocate cannot file or act in the Court directly**. They must **appear through an Advocate-on-Record (AoR)**, who alone is authorised to file pleadings and conduct procedural aspects of the case.

Thus, **only statements 2 and 4 are correct**.

5. What is the common characteristic of the constitutional provisions under Articles 249, 250 and 252 of the Constitution of India?

- A. They enable Parliament to enact laws on subjects in the State List under constitutionally specified circumstances.

- B. They permit Parliament to assume temporary legislative jurisdiction over selected State List matters under defined constitutional conditions.
- C. They authorize Parliament to exercise legislative competence over specified State List entries through constitutionally recognised exceptions.
- D. They empower Parliament to extend its legislative authority to matters in the State List when constitutionally sanctioned situations arise.

◦ Correct Answer : A

◦ **Answer Justification :**

Articles **249, 250 and 252** of the Constitution are special provisions that allow **Parliament to legislate on subjects enumerated in the State List under certain exceptional or constitutionally permitted circumstances**. Normally, under **Article 246 and the Seventh Schedule**, the State List falls within the exclusive legislative domain of the State legislatures. However, these Articles create **specific constitutional exceptions**.

Article 249 provides that if the **Rajya Sabha declares by a two-thirds majority** that it is necessary in the **national interest**, Parliament may legislate on a matter in the State List.

Article 250 allows Parliament to legislate on State List matters **during the operation of a national emergency (Article 352)**. Such laws cease to operate **six months after the emergency ends**.

Article 252 allows **two or more State legislatures to pass resolutions requesting Parliament** to legislate on a State List subject. Once Parliament enacts such a law, **only Parliament can amend or repeal it**, even for those States.

Thus, the **common characteristic** of these provisions is that they **permit Parliament to legislate on matters in the State List under specific constitutional circumstances**, thereby creating **exceptions to the normal federal distribution of legislative powers**.

6. Consider the following statements regarding debates on the Preamble in the Constituent Assembly of India:

1. K.T. Shah moved amendments proposing the explicit inclusion of the words “Secular”, “Federal” and “Socialist” in the Preamble.
2. H.V. Kamath proposed that the Preamble should begin with the phrase “In the name of God”.
3. The expressions “Socialist” and “Secular” were incorporated into the Preamble immediately after the adoption of the Constitution through the First Constitutional Amendment Act, 1951.

◦ Which of the statements given above are correct?

- A. I and II only
- B. II and III only
- C. I and III only
- D. I, II and III

◦ Correct Answer : A

◦ **Answer Justification :**

Statement I is correct: During the debates of the **Constituent Assembly**, **K.T. Shah** proposed several amendments to the Draft Preamble. He suggested that India should be explicitly described as a **“Secular, Federal, Socialist Republic.”** These proposals were intended to define the ideological character of the Indian state more clearly, though they were not accepted in the final text of the Constitution adopted in 1949.

Statement II is correct: **H.V. Kamath** proposed an amendment suggesting that the Preamble should begin with the phrase **“In the name of God.”** This reflected a broader debate within the Assembly on whether the Constitution should include a **religious invocation**. The Constituent Assembly ultimately chose a **secular formulation**, retaining the opening phrase **“We, the people of India.”**

Statement III is incorrect: The words **“Socialist”** and **“Secular”** were **not inserted through the First Constitutional Amendment Act, 1951**. They were added much later through the **42nd Constitutional Amendment Act, 1976**, during the Emergency. This amendment modified the expression **“Sovereign Democratic Republic”** to **“Sovereign Socialist Secular Democratic Republic.”**

Thus, **Statements I and II are correct, while Statement III is incorrect.**

7. Consider the following statements regarding Private Members’ Bills in the Parliament of India:

1. The Rules of Procedure of both Houses provide a separate slot for Private Members’ Business.
2. Private Members’ Business includes both Bills and Resolutions introduced by members who are not Ministers.
3. The discussion on Private Members’ Bills usually takes place on Fridays in both Houses of Parliament.
4. A Private Member’s Bill lapses upon the dissolution of the Lok Sabha if it is pending in that House.

◦ How many of the above statements are correct?

- A. Only one
- B. Only two
- C. Only three
- D. All the four

◦ Correct Answer : D

◦ **Answer Justification :**

Statement I is correct: The **Rules of Procedure and Conduct of Business** in both the **Lok Sabha and Rajya Sabha** provide a specific time slot for **Private Members’ Business**. This is distinct from Government business and ensures that non-minister MPs get an opportunity to introduce and discuss their legislative proposals.

Statement II is correct: Private Members' Business includes **both Private Members' Bills and Private Members' Resolutions**. These are legislative or policy proposals introduced by MPs **who are not Ministers**, allowing them to raise issues, propose new laws, or recommend policy changes.

Statement III is correct: In parliamentary practice, **Fridays are generally reserved for Private Members' Business** in both Houses. On these days, Private Members' Bills and Resolutions are taken up for discussion after the completion of Question Hour and other scheduled business.

Statement IV is correct: A **Private Member's Bill pending in the Lok Sabha lapses upon the dissolution of the Lok Sabha**, similar to other bills pending in that House.

Thus, **all statements are correct**.

8. Consider the following statements regarding the idea of constitutional morality in India:

1. It requires public authorities to act in fidelity to constitutional values.
2. It requires that political majorities operate within constitutional limits.
3. It mandates that constitutional institutions follow prevailing social morality while interpreting the Constitution.

◦ Which of the statements given above is/are incorrect?

- A. 3 only
- B. 1 and 3 only
- C. 2 and 3 only
- D. None

◦ Correct Answer : A

◦ **Answer Justification :**

Explanation

Statement 1 is correct: Constitutional morality requires **public authorities to act in fidelity to constitutional values and principles** such as liberty, equality, justice and fraternity. The term was emphasized by **Dr. B.R. Ambedkar in the Constituent Assembly**, who argued that the success of a constitutional system depends on institutions respecting the spirit of the Constitution, not merely following its formal procedures.

Statement 2 is correct: Constitutional morality implies that **political majorities must operate within constitutional limits**. Even if a government enjoys popular support, its actions must conform to the Constitution. The Supreme Court has reiterated this principle in several judgments, noting that **constitutional supremacy prevails over majoritarian impulses**.

Statement 3 is incorrect: Constitutional morality **does not require institutions to follow**

prevailing social morality. In fact, the concept often requires courts and institutions to **uphold constitutional values even when they conflict with dominant social attitudes or traditions.** The Supreme Court has relied on this reasoning in cases such as **Navtej Singh Johar v. Union of India (2018)** and **Indian Young Lawyers Association v. State of Kerala (Sabarimala case, 2018)**, emphasising that constitutional morality may prevail over societal morality.

Thus, **only statement 3 is incorrect.**

9. Consider the following statements:

Statement I: Checks and balances prevent concentration of power in any one organ of the State.

Statement II: The existence of judicial review and legislative oversight reflects the operation of checks and balances.

- Which one of the following is correct in respect of the above statements?
 - A. Both Statement I and Statement II are correct and Statement II explains Statement I
 - B. Both Statement I and Statement II are correct but Statement II does not explain Statement I
 - C. Statement I is correct but Statement II is incorrect
 - D. Statement I is incorrect but Statement II is correct

◦ Correct Answer : A

◦ **Answer Justification :**

Statement I is correct. The doctrine of **checks and balances** aims to prevent excessive concentration of power in any single institution. By distributing power among different branches of government, the system protects democratic governance and individual liberty.

Statement II is also correct and explains Statement I. In practice, mechanisms such as **judicial review, legislative oversight over the executive, and executive powers such as veto or ordinance-making** illustrate how different branches monitor and limit each other.

These institutional checks ensure that no branch can exercise authority arbitrarily.

Thus, Statement II explains Statement I.

10. Consider the following statements regarding personal data breach reporting under the Digital Personal Data Protection Rules, 2025:

Statement I: In the event of a personal data breach, the Data Fiduciary must notify the Data Protection Board of India.

Statement II: Notification to affected Data Principals is required only when the breach is likely to cause significant harm.

- Which one of the following is correct in respect of the above statements?

- A. Both Statement I and Statement II are correct
- B. Both Statement I and Statement II are incorrect
- C. Statement I is correct but Statement II is incorrect
- D. Statement I is incorrect but Statement II is correct

◦ Correct Answer : C

◦ **Answer Justification :**

Statement I is correct: Under the DPDP framework, when a personal data breach occurs, the Data Fiduciary must notify the **Data Protection Board of India**. The Board is the statutory authority responsible for examining compliance and initiating appropriate regulatory action in cases of violations.

Statement II is incorrect: The DPDP Rules do not limit notification to individuals only when “significant harm” is likely. Instead, the framework requires **affected Data Principals to be informed whenever a personal data breach occurs**, regardless of whether a specific harm threshold is established. The notification must be given without undue delay and should enable individuals to take precautionary measures.

Thus, **Statement I is correct but Statement II is incorrect.**

11. Consider the following statements regarding residuary taxation powers in India:

1. If a new form of tax emerges which is not mentioned in any entry of the Seventh Schedule, Parliament alone can impose such a tax.
2. The Constitution explicitly includes residuary taxation powers within the Union List through Entry 97.

◦ Which of the statements given above is/are correct?

- A. 1 only
- B. 2 only
- C. Both 1 and 2
- D. Neither 1 nor 2

◦ Correct Answer : C

◦ **Answer Justification :**

Explanation

Statement I - Correct

The Constitution vests **residuary legislative powers in Parliament** under **Article 248**. This includes the power to impose **taxes that are not mentioned in any entry of the Seventh Schedule**. Therefore, if a **new form of taxation emerges due to economic or technological developments** (for example, taxes on digital transactions before specific

legislation existed), **Parliament alone has the authority to impose such a tax.**

This provision ensures that **legislative competence over unforeseen or future subjects remains with the Union**, maintaining national uniformity.

Statement II - Correct

The constitutional scheme reinforces this power through **Entry 97 of the Union List (List I)**, which states:

“Any other matter not enumerated in List II or List III including any tax not mentioned in either of those Lists.”

Thus, **Entry 97 operationalizes the residuary power within the Seventh Schedule**, making it clear that **both new subjects and new forms of taxation fall within Parliament’s legislative domain.**

Key Constitutional Provisions

Article 248 - Residuary powers of legislation vested in Parliament.

Entry 97, Union List - Covers subjects and taxes **not enumerated in State List or Concurrent List.**

Therefore, **both statements are correct.**

12. A legislature passes a law claiming to regulate “public order” within the State. However, the provisions of the law primarily control activities relating to national security and defence establishments, which fall within the legislative competence of the Union. The court finds that the law merely disguises its true objective through its wording.

The situation described above most appropriately illustrates which one of the following doctrines?

- A. Doctrine of Pith and Substance
- B. Doctrine of Colourable Legislation
- C. Doctrine of Territorial Nexus
- D. Doctrine of Severability

○ Correct Answer : B

○ **Answer Justification :**

Explanation

The core idea here is that **what cannot be done directly cannot be done indirectly**. In the question, the legislature **claims** to regulate **public order**, which is ordinarily a State subject. But in reality, the law is aimed at **national security and defence establishments**, which lie within the **Union’s legislative domain**. So the law is only **apparently within competence**,

while its **true object** lies outside it.

That is the essence of the **Doctrine of Colourable Legislation**: the legislature uses a **disguise, label, or indirect route** to do something that it is **constitutionally not permitted to do directly**.

(a) Doctrine of Pith and Substance – Incorrect

This doctrine is used when a law appears to touch subjects in more than one legislative list, and the court determines the **true nature and dominant character** of the legislation. If in pith and substance the law falls within the legislature's competence, incidental encroachment is allowed.

Here, however, the emphasis is not merely on incidental overlap, but on a **disguised attempt** to trespass into a forbidden field. That makes **Colourable Legislation** more appropriate than **Pith and Substance**.

(c) Doctrine of Territorial Nexus – Incorrect

This doctrine applies when a State law seeks to operate on a person, property, or activity **outside the territorial boundaries of the State**, but there exists a **sufficient territorial connection** with the State.

The present case is not about **territorial connection**, but about **distribution of legislative power between State and Union**.

(d) Doctrine of Severability – Incorrect- This doctrine means that if only a **part** of a law is unconstitutional, that part may be severed and the **rest of the law may survive**, provided the valid and invalid parts are separable.

The question is not about separating valid and invalid portions of a statute; it is about identifying the doctrine governing a **camouflaged legislative encroachment**.

13. With reference to a Joint State Public Service Commission (JSPSC) under the Constitution of India, consider the following statements:

1. It may be established by Parliament if the Legislatures of two or more States pass resolutions to that effect.
2. The Chairman and members of a Joint State Public Service Commission hold office for a term of six years or until they attain the age of sixty-five years, whichever is earlier.
3. The Chairman or a member of a Joint State Public Service Commission can be removed from office only by the President of India.
4. The expenses of a Joint State Public Service Commission are charged upon the Consolidated Fund of India.

◦ How many of the statements given above are correct?

- A. Only one
- B. Only two
- C. Only three
- D. All the four

◦ Correct Answer : B

◦ **Answer Justification :**

Explanation

Statement 1 is Correct- Under **Article 315(2) of the Constitution of India**, a **Joint State Public Service Commission (JSPSC)** may be established for two or more States **by an Act of Parliament**, but only **after the Legislatures of the concerned States pass resolutions requesting such a commission**.

Thus, the initiative must originate from the States, while the **formal establishment is done through Parliamentary legislation**.

Statement 2 is Incorrect- According to **Article 316**, the **Chairman and members of a State Public Service Commission or a Joint State Public Service Commission hold office for six years or until they attain the age of 62 years, whichever is earlier**.

The **age limit of 65 years applies only to the Chairman and members of the Union Public Service Commission (UPSC)**.

Hence the statement incorrectly assigns the **UPSC age limit to a Joint State PSC**, making it wrong.

Statement 3 is Correct- Under **Article 317**, the **Chairman or any member of a State PSC or Joint State PSC can be removed only by the President of India**.

In cases of **misbehaviour**, the President refers the matter to the **Supreme Court**, which conducts an inquiry and reports whether the person should be removed. Based on this report, the President may order removal.

Thus, the **removal authority rests with the President**, not the Governor.

Statement 4 is Incorrect- The **expenses of a State PSC are charged on the Consolidated Fund of the State**. In the case of a **Joint State Public Service Commission**, the expenses are **shared by the participating States** and are charged on their respective **Consolidated Funds of the States**, as determined by the arrangement creating the commission.

Therefore, these expenses **are not charged upon the Consolidated Fund of India**, making the statement incorrect.

Key Constitutional Provisions

Article 315 - Public Service Commissions for the Union and the States

Article 316 - Appointment and term of office of members

Article 317 - Removal and suspension of members

Article 322 - Expenses of Public Service Commissions

14. Consider the following electoral outcomes of a political party in four different States:

1. State A: The party secured 6.2% of the valid votes in the Legislative Assembly election and won one seat in the State Assembly.
 2. State B: The party secured 7.8% of the total valid votes polled in the State Assembly election, but did not win any seat.
 3. State C: In the Lok Sabha election from that State, the party secured 5.9% of the valid votes and won one Lok Sabha seat.
 4. State D: The party won two seats in the State Legislative Assembly, which together constitute less than 3% of the total Assembly seats, and its vote share remained below 6%.
- In the light of the Election Commission of India's criteria for recognition of political parties, which one of the following is correct?
 - A. The party will be recognised as a State Party in one State only.
 - B. The party will be recognised as a State Party in two States.
 - C. The party will be recognised as a State Party in three States.
 - D. The party will not be recognised as a State Party in any State.

◦ Correct Answer : D

◦ **Answer Justification :**

Recognition of political parties is governed by the **Election Symbols (Reservation and Allotment) Order, 1968**, issued by the **Election Commission of India (ECI)**. A political party is recognised as a **State Party** if it satisfies **any one** of the following conditions in a State:

1. It secures **at least 6% of the valid votes in the State Legislative Assembly election and wins at least two Assembly seats.**
2. It secures **at least 6% of the valid votes in the Lok Sabha election from that State and wins at least one Lok Sabha seat.**
3. It wins **3% of the total seats in the Legislative Assembly or at least three seats, whichever is higher.**
4. It wins **one Lok Sabha seat for every 25 Lok Sabha seats allotted to that State.**
5. It secures **at least 8% of the total valid votes polled in the State.**

Applying these criteria to the given scenario:

1. **State A:** Although the party secured more than **6% of votes**, it won **only one Assembly**

seat, whereas the rule requires **at least two seats** along with the vote threshold. Hence, the condition is not satisfied.

2. **State B:** The party secured **7.8% of votes**, which is **below the 8% threshold**, and it did not win any seat. Therefore, the criterion is not fulfilled.
3. **State C:** The party won **one Lok Sabha seat**, but its **vote share is below 6%**, which is required under the Lok Sabha-based criterion.
4. **State D:** The party won **two Assembly seats**, but this does **not meet the requirement of 3% of total seats or at least three seats**.

Thus, the party **does not fulfil any of the criteria for recognition as a State Party in any of the four States**.

15. With reference to Cooperative Societies in India, consider the following statements:

1. The conduct of elections to the board of a Multi-State Cooperative Society is supervised by the Election Commission of India.
 2. In the board of a Multi-State Cooperative Society, two seats are required to be reserved for women members.
 3. To register a cooperative society, at least ten individuals competent to enter into a contract must come together as members.
- Which of the statements given above is/are correct?
 - A. II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

◦ Correct Answer : C

◦ **Answer Justification :**

Explanation

The functioning and governance of **Multi-State Cooperative Societies (MSCS)** are regulated by the **Multi-State Cooperative Societies Act, 2002**, as amended in **2023**, while cooperative societies in general are supported constitutionally by the **97th Constitutional Amendment Act, 2011**.

Statement I is incorrect: Elections to the board of a Multi-State Cooperative Society are **not conducted by the Election Commission of India**. Instead, the **Central Registrar of Cooperative Societies appoints the returning officer or authority** responsible for

conducting such elections under the provisions of the MSCS Act.

Statement II is correct: The **Multi-State Cooperative Societies (Amendment) Act, 2023** introduced provisions to strengthen inclusiveness in governance by mandating **reservation of two seats for women on the board of every multi-state cooperative society**.

Statement III is correct: Under the cooperative legal framework, **a minimum of ten persons competent to contract are required to form a cooperative society**. This principle has historically been part of cooperative legislation and is reflected in most **state cooperative laws as well as in the Multi-State Cooperative Societies Act**.

Hence, **Statements II and III are correct**.

16. With reference to the cultural history of India, the terms Cauka Pitaka, Dighala Pitaka and Yama Pitaka are related to which of the following?

- A. Types of Buddhist scriptures
- B. Types of folk music
- C. Types of paintings
- D. Types of wooden toys

◦ Correct Answer : C

◦ **Answer Justification :**

The Sanskrit play Vishakhadatta's Mudrakshaka mentions numerous paintings or patas, such as isolated framed drawings (Cauka-Pitaka), isolated paintings (Yama-Pitaka) and long scrolls of paintings (Dighala-Pitaka).

17. Consider the following pairs:

1. Langhnaj	stone tool workshop
2. Ramapurva	pillar edict
3. Sarnath	Rock edict

- How many of the pairs given above is/are correctly matched?
 - A. Only one
 - B. Only two
 - C. Only three
 - D. None

◦ Correct Answer : B

◦ **Answer Justification :**

Pair 1 is correct : Located on the banks of the Sabarmati River in Gujarat's Mehsana district, the archaeological site of **Langhnaj has yielded microliths. As the name suggests, microliths are small or micro stone tools usually synonymous with the Mesolithic period.** Sherds of pottery, innumerable animal bones and seven human burials were also excavated.

Pair 2 is correct: The motifs associated with the Ashokan pillars have a rich and varied symbolism with resonances in many different Indian religious traditions. Apart from floral designs such as the lotus and honeysuckle/palmette, the capitals have other, mostly animal, motifs. **The lion appears on the capitals of the Vaishali, Lauriya-Nandangarh, and one of the Rampurva pillars,** quadruple lions on the Sanchi And Sarnath capitals, **and a bull on one of the Rampurva pillars.** The Sanchi and Sarnath capitals were surmounted by a spoked wheel. The abacus of the Sanchi pillar has pecking geese, whereas that of the Sarnath pillar has a bull, elephant, horse, and lion, separated by wheels. The emblem of the Indian nation-state is based on the Sarnath capital.

Pair 3 is incorrect: Sarnath has pillar edict, it does not have any rock edicts

18. Which of the following statements correctly describes the term "Mrityukarvritti"?

- A. Punishment of death penalty reserved for those who raped a woman
- B. A circular released by Gupta king that explains the rights and duties of all those women who were associated with prostitution
- C. Practice of granting land to a soldier who died in battle while fighting for the king
- D. A Jaina practice of calling upon death when one believes he has suffered enough in this material world

◦ Correct Answer : C

◦ **Answer Justification :**

Explanation:

A Chandella inscription records the grant of land to the soldier who died in battle while fighting for the king (Mrityukavritti). The term 'Mrityukavritti' refers to those soldiers who died in battle showing exemplary valour while fighting for the king. Such soldiers were rewarded by granting land for the livelihood of their dependents. Chandellas ruled much of the Bundelkhand region of Central India for approximately 500 years between the 9th and the 13th centuries AD.

19. Consider the following regarding economic regions during the Sangam age:

1. Kurinji was associated with riverine tract in which agriculture was practised.

2. Mullai was associated with hilly region where hunting and gathering were practised.
3. Neythal was associated with coastal land where fishing and salt occurred.

- How many of the above statements are correct?
 - A. Only one
 - B. Only two
 - C. All three
 - D. None

- Correct Answer : A

- **Answer Justification :**

Sangam poems help us understand the social formation of the time. According to the thinai concept, Tamilagam was divided into five landscapes or eco-regions namely Kurinji, Marutam, Mullai, Neytal and Palai. Each region had distinct characteristics—a presiding deity, people and cultural life—according to the environmental conditions, as follows:

Statement 1 is incorrect: Kurinji refers to the hilly or mountainous regions in the southern part of India. Historically, the people living in these hilly regions often practised hunting and gathering as a means of subsistence.

Statement 2 is incorrect: Mullai refers to a forested or heavily wooded region. In the Mullai region, pastoralism (the practise of herding cattle and other livestock) was combined with shifting cultivation (a form of agriculture where fields are cultivated for a few years and then left fallow for regeneration).

Statement 3 is correct: Neythal refers to coastal land. In the Neythal region, the primary livelihood activities were fishing and salt-making.

1. Palai, in the context of ancient Tamil Sangam literature, refers to parched or arid land that was unsuitable for cultivation. In the Palai region, the challenging environmental conditions and lack of fertile soil made agriculture difficult. As a result, some people in the Palai region resorted to cattle lifting and robbery as alternative means of subsistence.
2. Marutham, in the context of ancient Tamil Sangam literature, refers to a riverine or alluvial tract. In the Marutham region, agriculture was practised using ploughs and irrigation

20. Consider the following statements about symbolism of horse in Vijaynagar Empire:

1. Rulers of the Vijaynagar were also addressed as the Asupati
2. Even the tail of a dead horse brought by the horse traders was paid with full amount equal to a live horse.
3. Nuniz records the purchase of over 30,000 war horses by the rulers of Vijaynagar every year.

4. The rulers of Vijaynagar patronized horse breeding and their care.
5. Krishnadevaraya even offered to Albuquerque large amounts in return of exclusive control over horse trade.

- How many of the above is/are correct?
 - A. two only
 - B. three only
 - C. four only
 - D. All five

- Correct Answer : B

- **Answer Justification :**

Statement 1 is correct.

The rulers of the Vijayanagara Empire were often referred to as "Asupati," meaning "Lords of Horses." This was due to their military prowess and the importance placed on horses in Hindu culture during the time.

Statement 2 is correct Even the tail of a dead horse brought by the horse traders was paid with a full amount equal to a live horse: This statement refers to a situation where the value or price of a dead horse was equal to that of a live horse.

Statement 5 is correct :Krishna Deva Raya offered large amounts of money to Albuquerque in return for exclusive control over the horse trade between the two territories, as horses were a valuable resource for the Vijayanagara army. However, it is unclear if Albuquerque accepted this offer or not.

Horses were imported by the Vijayanagara rulers from Iran and Arabia to build a strong military force. Horses were considered important for their fast movement in troops. The rulers of Vijayanagara did not patronise horse breeding. Nuniz records that the purchase of over 30,000 war horses by the rulers of Vijaynagar every year is not a correct statement. Hence, **Statement 3 and 4 are incorrect.**

- 21.** Consider the following statements with respect to Arya Samaj:

1. Arya Samaj was founded in 1875 by Dayanand Saraswati
2. Arya Samaj opposes the worship of murtis (images) and animal sacrifice.
3. Arya Samaj doesn't believe in the doctrine of Karma.
4. It focuses on the importance of the samskara.

- How many of the above is/are correct?
 - A. one only
 - B. two only
 - C. three only

D. All four

◦ Correct Answer : C

◦ **Answer Justification :**

Explanation:

The **Arya Samaj** was founded in **1875** by **Swami Dayanand Saraswati**. It was a **Hindu socio-religious reform organization** that sought to revive the authority of the **Vedas** and reform various social practices.

Hence, Statement 1 is correct.

The **Arya Samaj** strongly opposed practices such as **murti (idol) worship, animal sacrifice, shradha rituals for ancestors, caste based on birth rather than merit, untouchability, child marriage, pilgrimages, priestly dominance, and temple offerings**, considering them later distortions of the original **Vedic religion**.

Hence, Statement 2 is correct.

The core principles of the **Arya Samaj** emphasize that the **Vedas are infallible** and the **ultimate source of knowledge**. It rejected **idol worship** and the idea of **God taking incarnations**, but accepted the **doctrine of Karma** and the **transmigration of the soul**. Therefore, the claim regarding its doctrinal position in the statement is incorrect.

Hence, Statement 3 is incorrect.

The **Arya Samaj** also places significant emphasis on **“Samskaras” (life-cycle rituals)**, which are considered essential for leading a **righteous life according to Vedic principles**. These include rituals such as **marriage ceremonies, Upanayana (thread ceremony), and initiation into education**, all performed using **Vedic mantras and prescribed rituals**.

Hence, Statement 4 is correct.

22. Which one of the following Acts reserved seats for women in Legislatures in accordance with the allocation of seats for different communities?

- A. The Government of India Act, 1858
- B. The Indian Councils Act, 1909
- C. The Government of India Act, 1919
- D. The Government of India Act, 1935

◦ Correct Answer : D

◦ **Answer Justification :**

The Government of India Act 1935 significantly advanced women's political representation by reserving seats for them in provincial legislatures for the first time. It expanded the franchise, allowing roughly 6 million women to vote in the 1937 elections. Seats were allocated based on communal, caste, or special constituency, often tied to existing community divisions.

Key details regarding the 1935 Act and women's representation:

- **Reserved Seats:** The Act provided for reserved seats in provincial legislatures, often with specific, separate electorates.

- **1937 Elections:**

As a result of these provisions, in the 1937 elections, 41 women were elected from reserved constituencies, 10 from general constituencies, and 5 were nominated to provincial councils

- **Franchise Limitations:** Although it extended voting rights to more women (about 2.5% of the female population), it was not based on universal adult suffrage but rather on property and educational qualifications, including "wifeness" qualifications.

23. With reference to Trade Disputes Act (TDA) 1929, consider the following statements:

1. It provided a system of Courts of Inquiry and Consultation Boards for settling industrial disputes.
2. It made strikes in public utilities illegal in all circumstances.
3. It forbade trade union activity of coercive or purely political nature and even sympathetic strikes.

- How many of the above statements are correct?

- A. Only one
- B. Only two
- C. All three
- D. None

- Correct Answer : B

- **Answer Justification :**

Statement 1 is correct: Trade Disputes Act (TDA), 1929 made compulsory the appointment of Courts of Inquiry and Consultation Boards for settling industrial disputes i.e. It provides a system of Tribunals for settling industrial disputes.

Statement 2 is incorrect: It made the strikes in public utility services like posts, railways, water and electricity illegal, unless each individual worker planning to go on strike gave an advance notice of one month to the administration.

Statement 3 is correct: It forbade trade union activity of coercive or purely political nature and even sympathetic strikes. This angered HSRA(Hindustan Socialist republican Army) members Bhagat Singh and Batukeshwar Dutt , who later threw a bomb in the Legislative assembly to oppose this bill.

24. Consider the following statements in the context of the evolution of Civil Services in India:

1. Lord Cornwallis is credited for the establishment and organisation of Civil Services in India.
2. Lord Reading set up the Fort William College to train new recruits.
3. The Charter Act of 1833 provided funds for the development of English Education in India.
4. Lytton introduced the Statutory Civil Service.

◦ How many of the above statements are correct?

- A. Only one
- B. Only two
- C. Only three
- D. All four

◦ Correct Answer : B

◦ **Answer Justification :**

Statement 1 is correct: Cornwallis (Governor General, 1786-93) was the first Governor-General to bring into existence and organise the civil services. He tried to check corruption through: Increment of civil servants' salary; Strict enforcement of rules against private trade.

Statement 2 is incorrect: In 1800, Wellesley (Governor General, 1798-1805) set up the Fort William College for training of new recruits.

Statement 3 is incorrect: The Charter Act of 1813 included the provision of 1 lakh rupees for the development of english education in the country for the first time.

Statement 4 is correct: In 1878-79, Lytton introduced the Statutory Civil Service consisting of one-sixth of covenanted posts to be filled by Indians of high families through nominations by Local Governments, subject to approval by the Secretary of State and the Viceroy but it was a complete failure and was thus abolished

25. With reference to the Champaran Satyagraha (1917), which of the following leaders were associated with Mahatma Gandhi in organizing the movement?

1. Rajendra Prasad
2. Brajkishore Prasad
3. J. B. Kripalani

◦ Select the correct answer using the code given below:

- A. 1 and 2 only

- B. 2 and 3 only
- C. 1 and 3 only
- D. 1, 2 and 3

◦ Correct Answer : D

◦ **Answer Justification :**

Explanation

The **Champaran Satyagraha (1917)** in Bihar was the **first successful experiment of Mahatma Gandhi's method of Satyagraha in India**. It was launched to address the grievances of indigo cultivators who were forced to grow indigo under the exploitative **Tinkathia system**, which required peasants to cultivate indigo on **3/20th of their land**.

Several Indian leaders assisted Gandhi in organizing the movement, collecting testimonies from peasants, and conducting inquiries into the oppression of indigo planters.

Associated leaders:

- **Rajendra Prasad** - A prominent lawyer from Bihar who later became the **first President of India**. He provided legal and organizational support to Gandhi during the movement.
- **Brajkishore Prasad** - A leading nationalist from Bihar who played a crucial role in **mobilizing peasants and facilitating Gandhi's involvement in Champaran**.
- **J. B. Kripalani** - At the time a professor in Muzaffarpur, he assisted Gandhi in **coordinating volunteers and organizing the satyagraha activities**.

The movement eventually led to the **Champaran Agrarian Committee (1917)** and the **abolition of the Tinkathia system**, marking a significant milestone in India's freedom struggle.

26. In which of the following locations was the Provisional Government of Azad Hind proclaimed?

- A. Tokyo
- B. Rangoon
- C. Singapore
- D. Bangkok

◦ Correct Answer : C

◦ **Answer Justification :**

The Provisional Government of Azad Hind was a government-in-exile formed to represent an independent India **during World War II.**

- It was proclaimed **on 21 October 1943 in Singapore by Subhas Chandra Bose.**
- Bose had earlier taken leadership of the Indian National Army, which consisted largely of Indian prisoners of war captured by Japan in Southeast Asia.

Objectives

- The government had several major aims:
- End British colonial rule in India through armed struggle.
- Mobilize Indians abroad to support the independence movement.
- Establish a sovereign Indian state once British authority was removed.

Structure and Recognition

- Subhas Chandra Bose served as Head of State, Prime Minister, and Supreme Commander of the INA.
- The government was recognized by several Axis-aligned countries including Japan, Germany, Italy, and some Southeast Asian states.
- Japan also handed over the Andaman and Nicobar Islands to this government, which Bose renamed Shaheed and Swaraj Islands.

27. With reference to the Royal Indian Navy Mutiny, consider the following statements:

1. It began in Bombay in February 1946.
2. It involved sailors protesting against poor conditions and British rule.
3. It was fully supported by both the Congress and Muslim League leadership.

◦ Which of the statements given above are correct?

A. 1 and 2 only

- B. 2 and 3 only
- C. 1 only
- D. 1, 2 and 3

◦ Correct Answer : A

◦ **Answer Justification :**

Statement 1 is correct: The Royal Indian Navy Mutiny of February 1946 was one of the most significant military uprisings against British rule in the final phase of the Indian freedom struggle.

Statement 2 is correct: During World War II, conditions for Indian naval ratings were extremely poor, including low wages, inadequate food, racial discrimination, and harsh treatment by British officers.

- Growing nationalist sentiments among soldiers were also influenced by events such as the INA trials, which generated widespread sympathy for Indian soldiers who had fought against British rule.
- Beginning of the Revolt
- The mutiny began on 18 February 1946 at HMIS Talwar in Bombay.
- Naval ratings protested against poor conditions and soon raised nationalist slogans supporting independence.
- The rebellion quickly spread to 78 ships and about 20 naval establishments, involving nearly 20,000 sailors.

Spread and Public Support : The revolt spread to major port cities such as Karachi, Calcutta, Madras, and Vizagapatam. Civilian populations, workers, and students in Bombay supported the sailors with strikes and demonstrations. In many places, the sailors hoisted the flags of the Indian National Congress, the Muslim League, and the Communist Party, symbolizing unity against British rule.

Statement 3 is incorrect: Response of Political Leadership Despite the nationalist sentiment, major leaders of the freedom movement did not support the revolt.

- Leaders like Sardar Vallabhbhai Patel urged the sailors to surrender, fearing that an uncontrolled military revolt could lead to chaos and violent repression.

- Although the mutiny was eventually suppressed by British forces, it had major psychological and political consequences.

28. Consider the following cave sites with their religious affiliation and distinguishing feature:

Site	Religious Affiliation	Distinguishing Feature
1. Bagh	Buddhist	Materialistic paintings, Rang Mahal
2. Udayagiri (MP)	Hindu	Patronized by Chandragupta II, Varaha sculpture
3. Junagadh	Jain	Upar Kot citadel in front of prayer hall

- In how many of the above rows are the given information correctly matched?
 - A. Only two
 - B. Only one
 - C. All three
 - D. None
- Correct Answer : A

○ **Answer Justification :**

Explanation:

- **Row 1 is correct.** Bagh Caves is located on the bank of Baghni River in Madhya Pradesh, it is a group of **nine Buddhist caves** developed around **5th-6th century AD**. It is architecturally very *similar to the Ajanta caves*. Most significant cave here is **Rang Mahal**. Paintings in Bagh caves are more materialistic rather than spiritualistic.
- **Row 2 is correct.** Udayagiri Cave : It is located in Vidisha, Madhya Pradesh. Created in early 5th century AD under the patronage of Chandragupta II, it is famous for having numerous **sculptures** on the hill walls. The **sculpture of Varaha** or **Boar incarnation of the Vishnu** is notable. The caves have **one of the earliest Hindu sculptures**. It also has caves dedicated to Shiva, Narasimha (half-lion, halfman), Narayana (resting Vishnu) and Skanda.
- **Row 3 is incorrect.** Junagadh caves are **Buddhist**, not Jain, located in Junagadh district of Gujarat. In place of caves, three different sites can be found: (1) Khapra Kodiya, (2) Baba Pyare and (3) Uparkot. A unique feature of the Junagadh caves is the presence of a 30-50 ft high citadel known as **“Upar Kot”** in front of the prayer hall.

29. With reference to Hoysala temple architecture, consider the following statements:

1. Hoysala temples were generally built on a stellate (star-shaped) ground plan, often set on a raised platform known as jagati.
2. The exterior walls of these temples exhibit multiple projections and recesses, creating a zig-zag pattern that allows extensive sculptural decoration.
3. The temples of Belur, Halebid and Somnathpura, built in the Hoysala architectural style, are included in the UNESCO World Heritage List.

○ How many of the statements given above are correct?

- A. Only one
- B. Only two
- C. All three
- D. None

○ Correct Answer : C

○ **Answer Justification :**

Explanation

Statement 1 - Correct

Hoysala temples (12th-13th centuries CE) are famous for their **stellate or star-shaped ground plans**. These temples were typically built on a **raised platform called jagati**, which also served as a circumambulatory path (*pradakshinapatha*).

Statement 2 - Correct

The **outer walls are designed with numerous projections and recesses**, producing a **zig-zag or rhythmic pattern**. This architectural feature provided extensive surface area for the highly detailed sculptural carvings that characterize Hoysala temples.

Statement 3 - Correct

In **2023**, UNESCO inscribed the group titled **“Sacred Ensembles of the Hoysalas”** on the **World Heritage List**, which includes:

- **Chennakeshava Temple, Belur**
- **Hoysaleswara Temple, Halebid**
- **Keshava Temple, Somnathpura**

These temples are recognized for their **exceptional craftsmanship, soapstone sculptures, and synthesis of architectural traditions**.

30. Which of the following statements about ‘Princely States’ in India is not correct?

- A. The British Government declared that States were free to join either India or Pakistan or remain independent.
- B. The decision to join either India or Pakistan or remain independent was left not to the people of Princely States but to the Princely Rulers.
- C. The Ruler of Travancore first decided to remain independent.
- D. The State of Travancore finally joined India through a plebiscite.

◦ Correct Answer : D

◦ **Answer Justification :**

Statement 1 is correct

Just before Independence, the British ***gave the right to join either India or Pakistan or remain independent to the people of princely states***. Bikaner, Baroda, and a few other states from Rajasthan were the first ones to join the union. There were several other states that were adamant about not joining India. Some of them thought this to be the best moment to acquire independent statehood, while there were others who wanted to become a part of Pakistan.

Statement 2 is correct

The British government held the opinion that each of these states had the option of joining either Pakistan or India or remaining independent. The **princely kings** of these states, **not the people, were given the power to make this choice.**

Statement 3 is correct

Travancore was one of the first princely states to refuse accession to the Indian union and question the Congress' leadership of the nation. By 1946, the Dewan of Travancore, Sir C.P. Ramaswamy Aiyar declared his intention of forming an independent state of Travancore that would be open to the idea of signing a treaty with the Indian union.

He stuck to his position till as late as July 1947. He changed his mind soon after he survived an assassination attempt by a member of the Kerala Socialist Party. On July 30, 1947, Travancore joined India.

1. The State of Travancore joined Indian Union not through a plebiscite but through signing the '**Instrument of Accession**' by the ruler. A plebiscite implies a direct vote by all the people of the state, which did not happen in case of Travancore. **Hence, Statement 4 (option d) is Incorrect.**

31. Recently, scientists inaugurated the world's first global repository of mountain ice cores under the Ice Memory Project. Consider the following statements:

1. The repository is located at Concordia Station in Antarctica.
2. The stored ice cores act as climate archives containing past atmospheric information such as

greenhouse gases and pollutants.

- Which of the statements given above is/are correct?
 - A. 1 only
 - B. 2 only
 - C. Both 1 and 2
 - D. Neither 1 nor 2

◦ Correct Answer : C

◦ **Answer Justification :**

The world's first global repository of mountain ice cores has been established in Antarctica to preserve ice samples from glaciers that are rapidly melting due to climate change. These samples contain valuable records of Earth's past climate and atmospheric composition.

Statement 1 - Correct

The repository has been built near Concordia Station on the Antarctic Plateau. The extremely cold environment (around -50°C) naturally helps preserve the ice cores for very long periods.

Statement 2 - Correct

Ice cores contain trapped air bubbles, dust, pollen, and pollutants that reveal historical atmospheric composition and climate conditions, functioning as natural climate archives.

32. The Southern Transitional Council, sometimes seen in news, is primarily associated with which of the following regions?

- A. Northern Syria
- B. Southern Yemen
- C. Western Libya
- D. Eastern Sudan

◦ Correct Answer : B

◦ **Answer Justification :**

The Southern Transitional Council (STC) is a political and military organization in Yemen that seeks greater autonomy or independence for southern Yemen.

The STC was formed in 2017 during the ongoing Yemeni Civil War.

It represents southern Yemeni political and military factions advocating the restoration of an independent South Yemen (which existed until 1990 before unification with North Yemen).

The council controls significant territory including the port city of Aden.

It is backed by the United Arab Emirates and participates in the Saudi-backed anti-Houthi coalition.

33. In the context of European regional cooperation frameworks, consider the following pairs:

Forum	Member Countries
I. Weimar Triangle	France, Germany, Czech Republic
II. Benelux Union	Belgium, Netherlands, Luxembourg
III. Nordic Council	Norway, Finland, Switzerland

- Which of the pairs given above is/are correctly matched?
 - A. I only
 - B. II only
 - C. I and II only
 - D. II and III only

◦ Correct Answer : B

◦ **Answer Justification :**

Explanation

Pair I is incorrect- The **Weimar Triangle** is a trilateral cooperation forum comprising **France, Germany and Poland**, established in **1991** to strengthen dialogue between Western and Central Europe after the Cold War. The **Czech Republic is not a member**, making the pair incorrect.

Pair II is correct- The **Benelux Union** consists of **Belgium, the Netherlands and Luxembourg**. The term “Benelux” itself is derived from the names of these three countries. The cooperation began as a **customs union in 1944** and later evolved into a broader framework for **economic, political and administrative cooperation**.

Pair III is incorrect- The **Nordic Council** is an inter-parliamentary body consisting of **Denmark, Finland, Iceland, Norway and Sweden**, along with autonomous territories such as **Greenland, Faroe Islands and Åland**. **Switzerland is not part of the Nordic region** and therefore not a member.

Thus, **only one pair is correctly matched**.

34. With reference to the Biological Weapons Convention (BWC), consider the following statements:

1. It is the world’s first multilateral disarmament treaty to ban an entire category of weapons of mass destruction (WMD).

2. It came into force in 1975, and India is among its founding members.

- Which of the statements given above is/are correct?
 - A. 1 only
 - B. 2 only
 - C. Both 1 and 2
 - D. Neither 1 nor 2

◦ Correct Answer : C

◦ **Answer Justification :**

Explanation:

India hosted the international conference “50 Years of BWC: Strengthening Biosecurity for the **Global South**” in New Delhi to mark the 50th anniversary of the Biological Weapons Convention’s entry into force.

- **Statement 1 is correct:** The BWC (formally the Biological and Toxin Weapons Convention) was the first treaty to prohibit the development, production, acquisition, transfer, stockpiling, and use of an entire class of WMDs.
- **Statement 2 is correct:** The convention was opened for signature in 1972 and entered into force in **1975**. India was one of the early signatories and is considered a founding member, emphasizing its long-standing commitment to non-proliferation.

Key Features of the Biological Weapons Convention:

▪ **Core Prohibitions (Articles I-III):**

- No development, stockpiling, or use of biological and [toxin weapons](#).
- Obligation to destroy existing stockpiles.

▪ **No Verification Mechanism:**

- A major limitation: BWC lacks a **formal verification regime** to check compliance.
- Past violations include [Soviet Union](#) and **Iraq**.

- **Review Conferences:** Held roughly every five years to update norms, address technological advances and strengthen global governance.
- **International Cooperation (Article X):** Promotes peaceful use of biological science, especially capacity building for developing countries.
- **Global Norm Against Bioweapons:** Today no state openly acknowledges possessing or seeking [biological weapons](#), reflecting strong normative acceptance.
- **Political, Not Legal, Enforcement Mechanisms:** Complaints mechanism exists (Article VI) but rarely used.

35. With reference to the Commonwealth Games, consider the following statements:

1. The Commonwealth Games are a quadrennial multi-sport event featuring athletes from member nations of the Commonwealth of Nations.
2. The first British Empire Games were held in London, United Kingdom, in 1930.

◦ Which of the statements given above are correct?

- A. 1 only
- B. 2 only
- C. Both 1 and 2
- D. Neither 1 nor 2

◦ Correct Answer : A

◦ **Answer Justification :**

Explanation:

- India has been formally ratified as the host of the 2030 Commonwealth Games, with **Ahmedabad (Amdavad)**, Gujarat as venue.
- This will be the centenary edition of the Games, **marking 100 years** since the first British Empire Games.
- **Statement 1 is correct:** The Commonwealth Games are indeed a **quadrennial** (held every four years) multi-sport event. While the core participants are the 56 member nations of the Commonwealth of Nations, the term member nations in the context of the Games Federation also includes their associated **Overseas Territories and Crown Dependencies** (like Jersey, Bermuda, or the Falkland Islands), which compete as independent entities.

- **Statement 2 is incorrect:** The inaugural British Empire Games were held in **Hamilton, Canada**, in 1930, not London. The event was the brainchild of Melville Marks Robinson and featured 11 nations competing in six sports. London did not host the games until 1934.

36. Consider the following table regarding Pollutants and their Health Impacts:

Pollutant	Primary Source	Major Health Impact
I. Ground-level Ozone (O ₃)	Chemical reactions between NO _x and VOCs	Respiratory inflammation and airway constriction
II. Carbon Monoxide (CO)	Incomplete combustion of carbon fuels	Reduced oxygen-carrying capacity of blood
III. Nitrogen Dioxide (NO ₂)	High-temperature combustion in engines	Respiratory irritation

- How many of the above are correctly matched?
 - A. Only one
 - B. Only two
 - C. All three
 - D. None
- Correct Answer : C
- **Answer Justification :**

Explanation:

- **Ground-level ozone (O₃)** is a **secondary pollutant** formed in the lower atmosphere through photochemical reactions involving **nitrogen oxides (NO_x)** and **volatile organic compounds (VOCs)** in the presence of sunlight. These reactions commonly occur in urban areas with heavy vehicular emissions and industrial activity. Ozone is a powerful oxidant and irritant gas. Exposure can cause **inflammation of the respiratory tract, airway constriction, chest tightness, coughing, and reduced lung function**, especially affecting children, the elderly, and people with asthma.
- **Carbon monoxide (CO)** is produced primarily through **incomplete combustion of carbon-containing fuels** such as petrol, diesel, coal, wood, and natural gas. Common sources include motor vehicles, poorly ventilated stoves, and industrial processes. CO binds with haemoglobin in the blood to form **carboxyhaemoglobin**, which drastically reduces the blood's ability to transport oxygen to body tissues. This leads to symptoms such as headaches, dizziness, confusion, and in severe cases can result in unconsciousness or death.

- **Nitrogen dioxide (NO₂)** is generated mainly from **high-temperature combustion processes**, particularly in automobile engines, power plants, and industrial boilers. It is a reactive gas that irritates the respiratory system, contributing to **airway inflammation, aggravated asthma, and reduced lung function**. Long-term exposure also increases susceptibility to respiratory infections.

37. Consider the following statements:

Statement I: Ecological succession can occasionally result in the erosion of an ecosystem's resilience and a decrease in local biodiversity.

Statement II: In the absence of periodic disturbances, competitive exclusion by dominant climax species can lead to the local extinction of species that depend on early-stage habitats.

Statement III: The process of succession can facilitate the establishment of non-native, invasive species that may eliminate specialized native species.

- Which one of the following is correct in respect of the above statements?
 - A. Both Statement II and Statement III are correct and both of them explain Statement I
 - B. Both Statement II and Statement III are correct but only one of them explains Statement I
 - C. Only one of the Statements II and III is correct and that explains Statement I
 - D. Neither Statement II nor Statement III is correct

◦ Correct Answer : A

◦ **Answer Justification :**

Explanation:

Ecological succession is the **gradual and orderly process of change in species composition and community structure in an ecosystem over time**. It involves the sequential replacement of one community by another until a relatively stable community is established.

- While succession is usually viewed as a positive growth process, it has conceptual **disadvantages**.
- **Statement I is correct.** Paradoxically, as succession proceeds toward a stable climax, it can make an ecosystem **less resilient** to new types of surprises if it is managed for "constancy" or if natural disturbances are suppressed.
- **Statement II is correct and explains Statement I.** In many ecosystems, diversity is maintained by a "**mosaic of successional stages**". If disturbances (like fire or floods) are entirely prevented, the climax community eventually takes over everything. Through **competitive exclusion**, these dominant species can drive locally extinct those organisms that require open, sunny, or early-stage environments (like meadow flowers

or sun-loving birds).

- **Statement III is correct and also explains Statement I.** Succession provides windows of opportunity for **invasive species** to enter a community. For example, the invasion of Water Hyacinth in lakes can reset successional trajectories and eliminate native aquatic diversity.

As both Statement II and Statement III provide mechanisms for how succession can lead to the outcomes mentioned in Statement I, the correct answer is (a).

38. Match the species-type in Column I with its ecological role in Column II and the corresponding Indian example in Column III:

Column I (Species Type)	Column II (Ecological Role)	Column III (Indian Example)
(A) Keystone Species	(i) Sensitivity to sulfur dioxide pollution	(P) Bengal Tiger in forest ecosystems
(B) Indicator Species	(ii) Disproportionate effect relative to abundance	(Q) Lichens in industrial regions
(C) Umbrella Species	(iii) Conservation automatically protects other taxa	(R) Fig tree (<i>Ficus</i> spp.) in tropical forests

- Select the correct answer using the code given below:
 - A-iii-P, B-i-Q, C-ii-R
 - A-i-Q, B-ii-P, C-iii-R
 - A-ii-P, B-iii-Q, C-i-R
 - A-ii-R, B-i-Q, C-iii-P

◦ Correct Answer : D

◦ **Answer Justification :**

Explanation:

- **Keystone Species (A):** A keystone species is one whose impact on an ecosystem is disproportionately large relative to its abundance. Even though the species may not be numerically dominant, it plays a critical role in maintaining ecosystem structure and biodiversity. Removal of such a species can lead to cascading ecological changes. In tropical forests, **fig trees (*Ficus* spp.)** act as keystone resources because they produce fruits during periods when other food sources are scarce, thereby sustaining many birds, mammals, and insects. Hence, **A-ii-R** is correct.

- **Indicator Species (B):** Indicator species provide information about environmental conditions and ecosystem health. Their presence, absence, or population changes reflect specific environmental stresses such as pollution. **Lichens** are classic indicator species because they are highly sensitive to **sulfur dioxide pollution** and other atmospheric contaminants. Their decline in industrial areas historically signaled air pollution problems. Therefore, **B-i-Q** is correct.

- **Umbrella Species (C):** Umbrella species are species whose conservation indirectly protects many other species because they require large habitats or specific ecological conditions. Protecting them ensures the conservation of broader ecosystems. In India, the **Bengal Tiger** functions as an umbrella species; conserving tiger habitats under initiatives like Project Tiger protects entire forest ecosystems and associated biodiversity. Thus, **C-iii-P** is correct.

39. Which one of the following statements best reflects the scope and approach of "Synecology"?

- Select the correct option:
 - A. The study of the ecological relations and adaptations of a single individual species to its environment.
 - B. The philosophical belief that all living organisms have equal rights to live and prosper regardless of human vital needs.
 - C. The focus on maximizing the growth of a specific crop by identifying its most limiting nutrient according to Liebig's Law.
 - D. The study of the interactions and relationships between entire groups of species or communities in relation to their habitat.

◦ Correct Answer : D

◦ **Answer Justification :**

Explanation:

- **Synecology** is a branch of ecology that studies **communities of organisms and their interactions with each other and with their environment**. It focuses on the structure, composition, distribution, and functioning of ecological communities. Instead of examining a single species in isolation, synecology analyses **multiple species together**, exploring processes such as **competition, predation, symbiosis, trophic relationships, ecological succession, and energy flow within communities**. It therefore deals with how groups of species coexist and interact within a shared habitat.

- Option (a) describes **Autecology**, which studies the relationship of **a single species** with its environment, including its adaptations, tolerance limits, and ecological niche.

- Option (b) reflects the philosophy of **deep ecology**, an environmental ethical perspective that emphasizes the intrinsic value of all living organisms and advocates equal rights of all life forms.
- Option (c) refers to **Liebig's Law of the Minimum**, which states that the growth of an organism is limited by the **scarcest essential nutrient**, commonly applied in agriculture and plant nutrition.

40. Consider the following factors regarding the Sulphur Cycle:

Statement I: The release of sulphur dioxide SO_2 through coal combustion contributes to soil acidification via the formation of acid rain.

Statement II: Sulphate aerosols in the atmosphere reflect solar radiation, thereby exerting a net cooling effect on the Earth's surface.

- Which one of the following is correct in respect of the above statements?
 - A. Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
 - B. Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
 - C. Statement-I is correct but Statement-II is incorrect
 - D. Statement-I is incorrect but Statement-II is correct
- Correct Answer : B
- **Answer Justification :**

Explanation:

- **Statement I is Correct.** Burning coal releases **sulphur dioxide (SO_2)** into the atmosphere. Once released, SO_2 reacts with oxygen and water vapour to form **sulphuric acid (H_2SO_4)**. These acidic compounds return to the Earth's surface through precipitation, commonly known as **acid rain**. Acid rain lowers the **pH of soils and water bodies**, leading to soil acidification, nutrient leaching, and damage to vegetation. This process forms an important anthropogenic component of the **Sulphur Cycle**.
- **Statement II is Correct.** In the atmosphere, sulphur dioxide can be oxidized to form **sulphate aerosols**. These tiny particles scatter and reflect incoming solar radiation back into space. As a result, they **reduce the amount of solar energy reaching the Earth's surface**, producing a **net cooling effect** on the climate. This phenomenon is sometimes referred to as **aerosol radiative forcing**, and large volcanic eruptions that inject sulphur compounds into the atmosphere have historically caused temporary global cooling.

- Although both statements are correct, **Statement II does not explain Statement I**. Statement I deals with the **formation of acid rain and soil acidification**, whereas Statement II describes the **climate-cooling effect of sulphate aerosols** in the atmosphere. These are **different environmental consequences of sulphur emissions**.

41. Consider the following statements regarding the 'Range of Tolerance' in organisms:

Statement I: Eurythermal organisms can survive across a wide range of temperatures, whereas stenothermal organisms are restricted to a narrow temperature range.

Statement II: The ability of an organism to tolerate environmental fluctuations is often linked to its metabolic complexity and osmoregulatory efficiency.

- Which one of the following is correct in respect of the above statements?
 - A. Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
 - B. Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
 - C. Statement-I is correct but Statement-II is incorrect
 - D. Statement-I is incorrect but Statement-II is correct

◦ Correct Answer : A

◦ **Answer Justification :**

Explanation:

- **Eurythermal organisms** are species that can **tolerate a wide range of environmental temperatures**.
- **Stenothermal organisms** are species that can **tolerate only a narrow range of environmental temperatures**. Because their physiological processes function efficiently only within a limited temperature range, these organisms are highly sensitive to temperature fluctuations.
- **Statement I is correct**; it defines the standard ecological prefixes 'eury' (wide) and 'steno' (narrow). For example, many mammals are eurythermal as they can maintain internal temperatures across diverse climates, while coral polyps are stenothermal and bleach if temperatures fluctuate by even a few degrees.
- **Statement II is also correct** and provides the underlying biological explanation for Statement I. The "Range of Tolerance" is not an arbitrary limit but is dictated by the organism's internal mechanisms. **Euryhaline** fish like salmon can tolerate wide salinity changes because they possess sophisticated **osmoregulation** systems in their gills and

kidneys that can switch between salt-excreting and salt-absorbing modes.

- Similarly, the metabolic ability to regulate internal body temperature (homeostasis) allows eurythermal species to exploit diverse habitats. Therefore, Statement II explains why certain species have a broader "Range of Tolerance" (Statement I) than others.

42. Consider the following statements:

Statement I: The Earth's spin axis has shifted several meters over the past century.

Statement II: The melting of glaciers and ice sheets leads to a redistribution of mass from the poles toward the equatorial oceans, affecting the planet's rotation.

Statement III: Rapid cooling of the Earth's thermosphere due to solar flares is the primary cause of polar motion and axial wobble.

- Which one of the following is correct in respect of the above statements?
 - A. Both Statement II and Statement III are correct and both of them explain Statement I
 - B. Both Statement II and Statement III are correct but only one of them explains Statement I
 - C. Only one of the Statements II and III is correct and that explains Statement I
 - D. Neither Statement II nor Statement III is correct

○ Correct Answer : C

○ **Answer Justification :**

Explanation:

- **Statement I is Correct.** Scientific observations show that the **rotation axis of the Earth** has shifted by several meters over the last century. This phenomenon is known as **polar motion** or **axial drift**, where the geographic poles gradually move relative to the Earth's crust. Satellite measurements and geophysical studies indicate that the position of the poles has shifted by **a few meters since the late 19th century** due to changes in mass distribution within the Earth system.
- **Statement II is Correct and explains Statement I.** Large-scale **melting of glaciers and ice sheets**, especially in regions like Greenland Ice Sheet and Antarctica, redistributes enormous amounts of water mass from high latitudes toward the oceans, particularly toward lower latitudes. When mass moves across the planet, it alters the **moment of inertia** of the Earth, which in turn affects the planet's rotation and causes the **spin axis to shift slightly**. This process contributes significantly to observed polar motion.
- **Statement III is Incorrect.** Solar flares can temporarily influence the **thermosphere** by increasing temperature and causing atmospheric expansion, but they **do not drive**

long-term polar motion or axial wobble. The major drivers of such motion are **mass redistribution processes**, including glacier melt, groundwater extraction, tectonic adjustments, and mantle dynamics—not thermospheric cooling from solar activity.

- Therefore, only Statement II explains the phenomenon observed in Statement I. This illustrates the **interdisciplinary linkage** between anthropogenic climate change and the physical rotation of the Earth.

43. With reference to the "Agreement on Marine Biological Diversity of Areas Beyond National Jurisdiction" (BBNJ Agreement), consider the following statements:

1. The Agreement provides a legally binding framework for the establishment of Marine Protected Areas (MPAs) in international waters.
2. The treaty excludes "Marine Genetic Resources" (MGRs) from its purview to prevent commercial conflicts among member nations.

◦ Which of the above statements is/are incorrect?

- A. 1 only
- B. 2 only
- C. Both 1 and 2
- D. Neither 1 nor 2

◦ Correct Answer : B

◦ **Answer Justification :**

Explanation:

The **BBNJ Agreement** is an international treaty adopted in 2023 under the framework of the **United Nations Convention on the Law of the Sea**. Its objective is to ensure the **conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction (ABNJ)**, commonly known as the **high seas**, which cover nearly two-thirds of the global ocean.

- **Statement 1 is Correct.** One of the most important provisions of the BBNJ Agreement is the **legal framework for establishing Marine Protected Areas (MPAs) in international waters**. Until this treaty, there was no comprehensive global mechanism to designate and manage MPAs on the high seas. The agreement allows countries to propose, evaluate, and adopt conservation measures, including **large-scale MPAs**, through decisions of the Conference of Parties. This is expected to help achieve global conservation targets such as protecting **30% of the world's oceans by 2030**.
- **Statement 2 is Incorrect.** The treaty **does not exclude Marine Genetic Resources (MGRs)**. In fact, **MGRs are one of the four core pillars of the agreement**. The treaty establishes mechanisms for **fair and equitable sharing of benefits** derived

from genetic resources collected from the high seas, including potential commercial applications such as pharmaceuticals, biotechnology, and industrial products. The agreement also provides for **capacity building, technology transfer, and transparency** in the use of these resources.

44. With reference to the South Asia Wildlife Enforcement Network (SAWEN), consider the following statements:

1. It is a regional intergovernmental body that was officially launched in 2025 in Bhutan.
 2. The network comprises all eight countries of the South Asian Association for Regional Cooperation (SAARC).
 3. The Secretariat of SAWEN is hosted by the Government of India and is located in New Delhi.
- How many of the above statements are correct?
- A. Only one
 - B. Only two
 - C. All three
 - D. None

◦ Correct Answer : A

◦ **Answer Justification :**

Explanation:

- **Statement 1 is incorrect.** SAWEN was formally created in January 2011 during an intergovernmental gathering in **Paro, Bhutan**. It was established as a regional intergovernmental body to combat the growing transnational wildlife trade in South Asia.
- **Statement 2 is correct.** The network comprises **eight South Asian countries:** Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. These are the same eight nations that constitute the SAARC region.
- **Statement 3 is incorrect.** While India is a key member and adopted the SAWEN statute to enhance regional collaboration, the **Secretariat of SAWEN is hosted by the Government of Nepal and is located in Kathmandu.**
- The SAWEN Secretariat was formally established on April 20, 2011, in Kathmandu to act as a central hub for communication and coordination among member states. The organization focuses on **policy harmonization and institutional capacity strengthening** through knowledge and intelligence sharing to curb illegal trade that threatens the region's wild flora and fauna.

45. Consider the following statements:

1. Tidal energy is more predictable and consistent than solar or wind energy.
2. Tidal movements are primarily driven by the gravitational forces of the moon and the sun, which follow regular cycles.
3. Tidal barrages are essentially low-head dams across an estuary that trap water during high tide and release it through turbines during low tide.

◦ Which of the above statements are correct?

- A. 1 and 2 only
- B. 1 and 3 only
- C. 2 and 3 only
- D. 1, 2 and 3

◦ Correct Answer : D

◦ **Answer Justification :**

Explanation:

- **Statement 1 is correct.** Tidal energy is considered **more predictable and consistent** compared to solar and wind energy. Solar power depends on daylight availability and cloud cover, while wind power depends on atmospheric conditions that vary significantly. In contrast, tides occur at **regular intervals determined by astronomical cycles**, making tidal energy generation easier to forecast years in advance.
- **Statement 2 is correct.** Tides are primarily generated by the **gravitational forces exerted by the Moon and the Sun on Earth's oceans**. The Moon plays the dominant role due to its proximity to Earth. As Earth rotates and the Moon orbits around it, gravitational attraction creates periodic rises and falls in sea levels known as **high tides and low tides**. Because these celestial motions follow predictable cycles, tidal patterns are also highly predictable.
- **Statement 3 is correct.** A **tidal barrage** is a structure similar to a **low-head dam constructed across an estuary or tidal basin**. During **high tide**, seawater flows into the basin behind the barrage and is stored. As the tide recedes, the stored water is **released through turbines**, generating electricity. Some systems can generate power during both incoming and outgoing tides. This technology has been implemented in projects such as the **La Rance Tidal Power Plant in France**.

46. Consider the following statements regarding the 'Methodology of Tiger Census' (AITE) in India:

1. The M-STrIPES application is used only for counting the number of tigers in a specific reserve.
2. Photographic capture-recapture using unique stripe patterns is the primary method for

identifying individual tigers.

3. The census uses a 'Double Sampling' approach, combining ground-level surveys with statistical modeling.
 4. The 2022 Tiger Census was the first time that camera traps were used in India.
- How many of the above statements are correct?
 - A. Only one
 - B. Only two
 - C. Only three
 - D. All four
 - Correct Answer : B

◦ **Answer Justification :**

Explanation:

The **All India Tiger Estimation (AITE)**, coordinated by the **National Tiger Conservation Authority** and the **Wildlife Institute of India**, is the world's largest wildlife monitoring exercise. It uses a combination of **field surveys, camera trapping, and statistical models** to estimate tiger populations across India.

Statement 1 is Incorrect. The **M-STRIPES** application is **not used only for counting tigers**. It is primarily a **patrolling and monitoring tool** used by forest staff to record geo-referenced data on tiger signs, prey presence, human disturbances, and patrol routes. The collected data helps in protection, habitat monitoring, and ecological assessment, not just counting tigers.

Statement 2 is Correct. The main technique for identifying individual tigers during the census is **photographic capture-recapture using camera traps**. Each tiger has a **unique stripe pattern**, similar to human fingerprints. By comparing photographs captured at different locations, researchers can identify individual animals and estimate population size.

Statement 3 is Correct.

The tiger census follows a **double sampling approach**. This method combines:

- **Extensive ground surveys** that record tiger signs (pugmarks, scat, scrapes), prey abundance, and habitat parameters, and
- **Intensive camera trap surveys** in selected areas.
The data are then integrated through **statistical modeling** to estimate tiger populations across large landscapes.

Statement 4 is Incorrect. Camera traps were **introduced in India's tiger estimation in the mid-2000s**, particularly after the 2006 tiger census reforms following concerns over earlier pugmark methods. The **2022 census was not the first use of camera traps**; rather,

it represented the **largest deployment of camera traps in the history of the exercise.**

47. Consider the following statements:

Statement-I: Certain plant species are used for the removal of heavy metals from contaminated soils, a technique known as phytoremediation.

Statement-II: Such plants restrict heavy metal accumulation exclusively to their root systems and prevent translocation to aerial parts.

- Which one of the following is correct in respect of the above statements?
 - A. Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
 - B. Both Statement-I and Statement-II are correct but Statement-II is NOT the correct explanation for Statement-I
 - C. Statement-I is correct but Statement-II is incorrect
 - D. Statement-I is incorrect but Statement-II is correct

◦ Correct Answer : C

◦ **Answer Justification :**

Statement-I: CORRECT. Phytoremediation is a well-established bioremediation technique where specific plant species (hyperaccumulators) are used to extract heavy metals like lead, cadmium, zinc, and arsenic from contaminated soils.

Statement-II: INCORRECT. Hyperaccumulator plants used in phytoremediation are specifically characterized by their ability to translocate heavy metals from roots to above-ground shoots and leaves (phytoextraction). The metals are accumulated in aerial biomass, which is then harvested and disposed of. This translocation capacity is what makes phytoremediation effective — restricting metals to roots alone would be phytostabilization, a different mechanism.

Why in news: Phytoremediation projects for mine-waste reclamation and Ganga basin contaminated soil restoration reported in news.

48. With reference to biochar, sometimes mentioned in news in the context of sustainable agriculture, consider the following statements:

1. It is produced by pyrolysis of biomass in an oxygen-limited environment.
2. Its application to soil can enhance water-holding capacity and cation exchange capacity.
3. It is highly stable in soil and can persist for hundreds to thousands of years.

- Which of the statements given above is/are correct?
 - A. 1 only
 - B. 1 and 2 only
 - C. 2 and 3 only
 - D. 1, 2 and 3

◦ Correct Answer : D

◦ **Answer Justification :**

Statement 1: CORRECT. Biochar is produced by pyrolysis — thermal decomposition of biomass (crop residues, wood waste, animal manure) in an oxygen-limited or oxygen-free environment at temperatures typically between 300–700°C.

Statement 2: CORRECT. Biochar's porous structure increases soil water-holding capacity and its high surface area with charged functional groups enhances cation exchange capacity (CEC), improving nutrient retention.

Statement 3: CORRECT. Biochar is composed primarily of stable aromatic carbon rings that resist microbial decomposition. It can persist in soil for centuries to millennia — this is what makes it a carbon sequestration tool distinct from compost or mulch.

49. Consider the following:

1. Trichogramma wasps are used as predators of adult bollworms in cotton fields.
2. Pheromone traps are used for monitoring and mass trapping of specific pest species.
3. Nuclear Polyhedrosis Virus (NPV) is a broad-spectrum chemical insecticide used in Integrated Pest Management (IPM).
4. Neem-based formulations can act as insect growth regulators and feeding deterrents.

◦ How many of the above are correctly described?

- A. Only one
- B. Only two
- C. Only three
- D. All four

◦ Correct Answer : B

◦ **Answer Justification :**

Statement 1: INCORRECT. Trichogramma wasps are egg parasitoids, not predators of adult bollworms. They lay their eggs inside the eggs of lepidopteran pests (including bollworms), and the wasp larvae consume the host egg from within, preventing pest emergence.

Statement 2: CORRECT. Pheromone traps use synthetic sex pheromones to attract specific pest species. They serve dual purposes in IPM: population monitoring (to time interventions) and mass trapping (to reduce pest populations directly).

Statement 3: INCORRECT. Nuclear Polyhedrosis Virus (NPV) is a biological control agent (baculovirus), not a chemical insecticide. It is host-specific, targeting specific lepidopteran larvae (particularly *Helicoverpa armigera* in cotton), and is environmentally safe — the opposite of "broad-spectrum chemical."

Statement 4: CORRECT. Neem-based formulations (particularly azadirachtin) act as anti-feedants, insect growth regulators (disrupting moulting), and oviposition deterrents. They are widely used in IPM protocols.

50. Consider the following locations:

1. Kandla, Gujarat
2. Thoothukudi, Tamil Nadu
3. Paradip, Odisha
4. Jaisalmer, Rajasthan

◦ How many of the above have been identified by the Government of India as Green Hydrogen Hubs under the National Green Hydrogen Mission?

- A. Only one
- B. Only two
- C. Only three
- D. All four

◦ Correct Answer : C

◦ **Answer Justification :**

Item 1 - Kandla, Gujarat: CORRECT. Kandla has been identified as a Green Hydrogen Hub under the National Green Hydrogen Mission, leveraging its port infrastructure for production, storage, and export of green hydrogen and derivatives.

Item 2 - Thoothukudi, Tamil Nadu: CORRECT. Thoothukudi (V.O. Chidambaranar Port) has been identified as a Green Hydrogen Hub. In October 2025, Sembcorp Industries signed MoUs with V.O. Chidambaranar Port Authority to develop an integrated green hydrogen and ammonia hub.

Item 3 - Paradip, Odisha: CORRECT. Paradip Port has been identified as a Green Hydrogen Hub, with plans for production, storage, and export facilities with streamlined clearances and infrastructure support.

Item 4 - Jaisalmer, Rajasthan: INCORRECT. While Rajasthan is a major state for renewable energy generation (solar), Jaisalmer has not been designated as one of the three coastal Green Hydrogen Hubs. The three identified hubs are specifically coastal locations chosen for their port access to facilitate export.

51. Consider the following statements:

1. India pledged to achieve net zero carbon emissions by the year 2070 at the COP26 summit held in Glasgow.
2. India's per capita carbon dioxide emissions are currently higher than the global average.
3. India is the third largest emitter of carbon dioxide in the world in terms of total annual

emissions.

- Which of the statements given above is/are correct?
 - A. 1 and 2 only
 - B. 2 and 3 only
 - C. 1, 2 and 3
 - D. 1 and 3 only

◦ Correct Answer : D

◦ **Answer Justification :**

Statement 1 is CORRECT. Prime Minister Narendra Modi announced at **COP26 in Glasgow (November 2021)** that India would achieve **net zero carbon emissions by 2070**. This was part of the "Panchamrit" (five-nectar) climate action plan, which also included targets for 500 GW non-fossil fuel capacity by 2030 and reducing carbon intensity by 45%.

Statement 2 is INCORRECT —India's per capita CO₂ emissions are approximately **1.9-2.0 tonnes** (as of recent data). The **global average** is approximately **4.7 tonnes per capita**. Therefore, India's per capita emissions are **LESS than half** the global average, not higher.

Statement 3 is CORRECT. India is the **third largest emitter** of CO₂ in the world in terms of total annual emissions, after China (first) and the United States (second). India's total emissions are approximately 2.9 billion tonnes of CO₂ annually. While its total emissions are high due to population size, its per capita emissions remain well below the global average

52. Consider the following pairs:

- I. Central Pollution Control Board (CPCB) — constituted under the Water (Prevention and Control of Pollution) Act, 1974
- II. Central Ground Water Authority (CGWA) — constituted under the Environment (Protection) Act, 1986
- III. National Green Tribunal (NGT) — constituted under the Environment (Protection) Act, 1986

- How many of the above pairs are correctly matched?
 - A. Only one
 - B. Only two
 - C. All three
 - D. None

◦ Correct Answer : B

◦ **Answer Justification :**

CPCB — constituted under Water (Prevention and Control of Pollution) Act, 1974 — CORRECT

The Central Pollution Control Board (CPCB) was originally constituted under Section 3 of the **Water Act, 1974**. It was subsequently entrusted with powers and functions under the **Air (Prevention and Control of Pollution) Act, 1981** as well. But its original constitution was under the Water Act. The State Pollution Control Boards (SPCBs) were also constituted under the same act.

II. CGWA – constituted under EPA, 1986 – CORRECT

The Central Ground Water Authority (CGWA) was constituted under Section 3(3) of the **Environment (Protection) Act, 1986**. It has the mandate to regulate and control groundwater development and management.

III. NGT – constituted under EPA, 1986 – INCORRECT

The National Green Tribunal (NGT) was constituted under the **National Green Tribunal Act, 2010** – a separate, standalone legislation. It was NOT constituted under the EPA 1986. The NGT Act was enacted specifically to provide for effective and expeditious disposal of cases relating to environmental protection.

53. With reference to Cloud Computing service models, consider the following statements:

1. In Software as a Service (SaaS), is primarily used by developers to build and deploy applications without worrying about operating systems.
 2. Infrastructure as a Service (IaaS) provides virtualized computing resources, such as servers and storage, over the internet.
 3. Platform as a Service (PaaS) users can access software applications over the internet without managing the underlying infrastructure.
- How many of the statements given above are correct?
 - A. Only one
 - B. Only two
 - C. All three
 - D. None

◦ Correct Answer : A

◦ **Answer Justification :**

Cloud computing is generally categorized into three main service models based on the level of control and management provided to the user.

- **Statement I is incorrect:** The description provided belongs to **Platform as a Service (PaaS)**. SaaS is for end-users who want to use a finished software product (like Gmail or Microsoft 365) via the web.
- **Statement II is correct: Infrastructure as a Service (IaaS)** is the most basic level of

cloud computing. It provides the fundamental building blocks—virtual servers, storage, and networking—which users can rent and manage.

- **Statement III is incorrect:** The description provided belongs to **Software as a Service (SaaS)**. PaaS is specifically designed for developers, providing a framework (operating systems, databases, and development tools) to build and run applications.

54. The terms 'Kamo'oailewa', 'Apophis', and 'Psyche 16', recently mentioned in the media, are best described as:

- Select the correct description:
 - A. Newly discovered exoplanets in the Goldilocks Zone.
 - B. Near-Earth Objects (NEOs) targeted for planetary defense or study.
 - C. Satellites launched by private space companies for global internet.
 - D. Theoretical regions of space where dark matter is most concentrated.
- Correct Answer : B
- **Answer Justification :**

All three terms refer to **Near-Earth Objects (NEOs)**—asteroids or comets whose orbits bring them into proximity with Earth. They have been in the news due to high-profile space missions or potential impact assessments.

- **Kamo'oailewa:** A **quasi-satellite** of Earth. While it orbits the Sun, its path keeps it in close proximity to Earth. Scientific analysis suggests it may be a fragment of the **Moon** blasted off during an ancient impact.
- **Apophis:** An asteroid that will make an extremely close approach to Earth on **April 13, 2029**. It is a primary subject for **planetary defense** because it will pass within the orbit of geostationary satellites.
- **Psyche 16:** A unique, **metal-rich asteroid** located in the main asteroid belt between Mars and Jupiter. NASA's **Psyche mission** is currently en route to study it, as it is believed to be the exposed nickel-iron core of an early planetesimal.

55. With reference to Prime Editing, consider the following statements:

1. Prime Editing is more precise as it significantly reduces unintended insertions or deletions at the target site.
2. Unlike CRISPR-Cas9, Prime Editing is capable of performing all twelve possible base-to-base conversions.
3. Prime Editing can only perform small-scale edits and is incapable of inserting or deleting

entire gene sequences.

- Which of the statements given above is/are correct?
 - A. I and II only
 - B. II and III only
 - C. I only
 - D. I, II and III

◦ Correct Answer : A

◦ **Answer Justification :**

Explanation:

- **Statement I is correct:** Traditional CRISPR-Cas9 creates **Double-Strand Breaks (DSBs)**, which rely on the cell's messy natural repair pathways (NHEJ), often leading to random insertions or deletions (indels). Prime Editing avoids DSBs by nicking only one strand, making it much more precise and reducing unintended mutations.
- **Statement II is correct:** Prime Editing is highly versatile. While older Base Editors could only perform certain transitions (e.g., C to T), Prime Editing can perform **all twelve possible types of point mutations** (transitions and transversions), making it a true universal search-and-replace tool.
- **Statement III is incorrect:** While Prime Editing is currently most efficient at smaller edits (point mutations and small insertions/deletions), it is **not fundamentally incapable** of larger changes. The technology is specifically designed to allow for targeted insertions and deletions; the incapable part is too restrictive a claim for an emerging technology.

56. With reference to applications of Visible Light Communication (Li-Fi), consider the following:

1. Underwater communication for high-speed data transfer
2. Use in hospitals to avoid interference with medical equipment
3. In-flight connectivity inside aircraft cabins
4. Smart street lighting for localized data broadcasting
5. Vehicle-to-infrastructure communication

- How many of the above are correct applications of Li-Fi?
 - A. Only two
 - B. Only three
 - C. Only four
 - D. All five

◦ Correct Answer : D

◦ **Answer Justification :**

Explanation:

Visible Light Communication (Li-Fi) uses light-emitting diodes (LEDs) to transmit data. Because it uses the visible light spectrum rather than radio waves, it is suitable for environments where Wi-Fi is restricted or inefficient.

- **Underwater Communication:** Radio waves are absorbed by water, making Wi-Fi ineffective. Light can travel through water, allowing Li-Fi to facilitate high-speed data transfer between divers or submersibles.
- **Hospitals:** Traditional Wi-Fi can interfere with sensitive medical equipment (like MRI machines). Li-Fi uses light, which is electromagnetically silent, making it safe for use in operating theaters and wards.
- **Aviation:** In aircraft cabins, Li-Fi provides high-speed connectivity without interfering with the plane's radio-frequency-based flight controls.
- **Smart Street Lighting:** Existing LED streetlights can be converted into hotspots to broadcast localized data (like traffic updates or maps) to pedestrians.
- **Vehicle-to-Infrastructure (V2I):** Car headlights and streetlights can talk to each other using Li-Fi to share real-time data on speed, road conditions, and safety alerts.

Value addition:

- Li-Fi uses **LED (Light Emitting Diode)** bulbs to transmit data by flickering at speeds imperceptible to the human eye, potentially reaching speeds over **100 Gbps**, which is significantly faster than standard Wi-Fi.
- It utilizes the **Visible Light Spectrum** (400 THz to 800 THz), which is approximately 10,000 times larger than the Radio Frequency (RF) spectrum used by Wi-Fi, helping to resolve the Spectrum Crunch.
- Unlike radio waves, **light cannot penetrate opaque walls.**
- This keeps the data signal confined to a physical room, making it much harder for

hackers to intercept the connection from outside.

57. With reference to Hypersonic Glide Vehicles (HGVs), consider the following statements:

1. They are launched into the upper atmosphere by a conventional rocket booster.
2. They follow a predictable parabolic trajectory similar to Intercontinental Ballistic Missiles (ICBMs).
3. They can manoeuvre at high altitudes to evade interceptor missiles.

◦ Which of the statements given above is/are correct?

- A. I and II only
- B. II and III only
- C. I and III only
- D. I, II and III

◦ Correct Answer : C

◦ **Answer Justification :**

Explanation:

- **Statement I is correct:** HGVs do not have their own primary engine for takeoff. They are typically boosted into the upper atmosphere (near-space) using a conventional rocket booster.
 - Once they reach a certain altitude and speed, the glide vehicle separates from the booster.
- **Statement II is incorrect:** This is the defining difference between a standard ballistic missile and an HGV.
 - ICBMs follow a **predictable parabolic (ballistic) trajectory**, much like a thrown ball. HGVs, however, skip or glide along the atmosphere in a **non-ballistic** path that is much harder to predict.
- **Statement III is correct:** Because they stay within the atmosphere (unlike ICBMs which go into deep space), HGVs can use aerodynamic surfaces (fins or body shape) to maneuver and change direction at hypersonic speeds.
 - This allows them to dodge interceptor missiles and bypass traditional missile defense systems like THAAD or S-400.

HGVs vs. Ballistic Missiles:

Feature	Ballistic Missile (ICBM)	Hypersonic Glide Vehicle (HGV)
Path	Predictable Parabolic Arc	Unpredictable, Maneuverable Glide
Altitude	High (Deep Space)	Mid (Near-Space/Atmosphere)
Detection	Easy to track early	Difficult (Detected late in flight)
Interception	Vulnerable to terminal defenses	Highly elusive

58. With reference to microplastics, consider the following statements:

1. They are plastic particles smaller than 5 mm in size, including microbeads and fragments from larger plastics.
2. They are chemically inert and do not interact with persistent organic pollutants (POPs) or heavy metals.
3. Most biodegradable plastics decompose into harmless nutrients in the open ocean.

◦ Which of the statements given above is/are correct?

- A. 1 only
- B. 1 and 2 only
- C. 3 only
- D. 2 and 3 only

◦ Correct Answer : A

◦ **Answer Justification :**

Explanation:

▪ **Statement 1 is correct:** By international scientific consensus, microplastics are defined as plastic particles smaller than **5 millimeters** in diameter.

- This includes **Primary Microplastics** (manufactured as small particles like microbeads in cosmetics or industrial nurdles) and **Secondary Microplastics** (fragments resulting from the weathering of larger items like bottles, tires, or fishing nets).

▪ **Statement 2 is incorrect:** Microplastics are **not** chemically inert. Because they are hydrophobic (water-repelling) and have a high surface-area-to-volume ratio, they act as **chemical sponges**.

- They actively adsorb and concentrate **Persistent Organic Pollutants (POPs)** like PCBs and DDT, as well as heavy metals (Lead, Mercury) from the surrounding seawater.

- **Statement 3 is incorrect:** This is a common greenwashing misconception. Most biodegradable plastics, such as **Polyactic Acid (PLA)**, are designed for **industrial composting** which requires high temperatures.

- In the cold, high-pressure, and oxygen-poor environment of the **open ocean**, these plastics do not decompose; they simply fragment into bio-based microplastics that persist for decades.

59. With reference to Satellite Internet Systems, consider the following statements:

1. Geostationary satellites remain fixed relative to a point on Earth because they revolve around the Earth with the same angular velocity as the Earth's rotation.
2. Signals transmitted through geostationary satellites experience lower latency compared to those transmitted through Low Earth Orbit satellites.
3. Low Earth Orbit satellites cannot provide global coverage with a single satellite due to their proximity to Earth.

- How many of the statements given above are correct?

- A. Only one
- B. Only two
- C. All three
- D. None

- Correct Answer : B

- **Answer Justification :**

Explanation:

- **Statement I is correct:** Geostationary Earth Orbit (GEO) satellites are placed at a specific altitude of approximately 35,786 km directly above the Earth's equator. At this height, their orbital period matches the Earth's rotation (24 hours).

- Because they possess the same angular velocity as the Earth, they appear to hover over a fixed spot on the ground.

- **Statement II is incorrect:** Latency (the time delay in data transmission) is primarily determined by the distance the signal must travel. Signals sent via GEO satellites must travel a round-trip of over 70,000 km, leading to a high latency of about 600 milliseconds.

- Low Earth Orbit (LEO) satellites, orbiting at much lower altitudes (500 km to 2,000 km), have significantly lower latency (roughly 25–40 milliseconds), making

them superior for real-time applications like video calls.

- **Statement III is correct:** There is an inverse relationship between a satellite's altitude and its footprint (coverage area). While a single GEO satellite can see nearly one-third of the Earth's surface, a LEO satellite is so close to the planet that its footprint is very small—often compared to the size of a large metropolitan city.
 - To achieve global coverage, LEO systems require mega-constellations consisting of hundreds or thousands of satellites working in unison.

60. Which of the following correctly describes quantum mechanical tunnelling?

- Select the correct option:
 - A. A phenomenon where a particle crosses a potential barrier only after gaining energy equal to or greater than the barrier height.
 - B. A phenomenon where a particle loses energy while interacting with a barrier and is reflected with reduced kinetic energy.
 - C. A phenomenon where a particle temporarily stores energy within a barrier before re-emerging on the other side.
 - D. A phenomenon where a particle can penetrate a potential barrier even when its energy is lower than the barrier height due to its wave-like nature.
- Correct Answer : D
- **Answer Justification :**

Explanation:

The 2025 Nobel Prize in Physics has been awarded by the Royal Swedish Academy of Sciences to **John Clarke, Michel Devoret, and John Martinis** for their discovery of macroscopic quantum mechanical tunnelling and energy quantisation in an electric circuit.

- **Option (a) is incorrect:** This describes **Classical Mechanics**. In the classical world, if a ball (particle) does not have enough kinetic energy to go over a hill (barrier), it is 100% certain to be reflected.
- **Option (b) is incorrect:** Tunnelling does not necessarily involve a loss of energy during the transition; the particle's energy remains the same, but its **probability amplitude** decreases as it passes through.
- **Option (c) is incorrect:** There is no storage of energy. The particle exists on the other side of the barrier due to the non-zero value of its wave function within and beyond the

barrier.

- **Option (d) is correct:** In **Quantum Mechanics**, particles (like electrons or protons) exhibit **wave-particle duality**. When a particle's probability wave encounters a thin energy barrier, the wave does not stop abruptly. Instead, it decays exponentially inside the barrier.
 - If the barrier is thin enough, the wave emerges on the other side with a reduced but non-zero amplitude, meaning there is a real probability the particle will be found there.

61. With reference to applications of 3D bioprinting, consider the following:

1. Development of patches to repair damaged heart tissue
2. Treatment of knee cartilage injuries
3. Use of light-activated proteins to restore vision
4. Portable device to create skin patches from a patient's own cells

◦ How many of the above are applications of 3D bioprinting?

- A. Only one
- B. Only two
- C. Only three
- D. All four

◦ Correct Answer : C

◦ **Answer Justification :**

Explanation:

- **Development of patches to repair damaged heart tissue – Correct:** 3D bioprinting can fabricate **cardiac tissue patches** using bio-inks containing living cells, which may help repair damaged myocardium after heart attacks.
- **Treatment of knee cartilage injuries – Correct:** Bioprinting is being used to create **meniscus and cartilage structures** for repairing musculoskeletal injuries such as knee cartilage tears.
- **Use of light-activated proteins to restore vision – Incorrect:** This approach is related to **optogenetics and gene therapy**, not 3D bioprinting. It involves modifying retinal cells with light-sensitive proteins rather than printing biological tissues.

- **Portable device to create skin patches from a patient's own cells – Correct:** Handheld **bioprinters** are being developed to print **skin grafts directly onto wounds**, using the patient's own cells to accelerate healing.

What is 3D Bioprinting?

- 3D bioprinting is an advanced manufacturing technology that uses bio-inks made of living cells, biomaterials, and growth factors to print biological tissues layer-by-layer, mimicking the structure and function of natural organs.

Key Features of 3D Bioprinting

- **Layer-by-Layer Fabrication:** Tissues are built in successive layers using computer-controlled printers, enabling precise replication of complex biological structures.
- **Use of Bio-inks:** Special inks composed of living cells and biocompatible materials allow the printed structure to grow and function like natural tissue.
- **High Precision and Customization:** Bioprinting enables patient-specific tissue fabrication, reducing the risk of immune rejection in medical applications.
- **Applications in Regenerative Medicine:** It is widely used in tissue engineering, drug testing, organ repair, and development of artificial tissues such as skin, cartilage, and cardiac patches.

62. Which of the following glands in the human body is responsible for regulating the 'Circadian Rhythm' (sleep-wake cycle)?

- A. Pituitary Gland
- B. Thyroid Gland
- C. Pineal Gland
- D. Adrenal Gland

◦ Correct Answer : C

◦ **Answer Justification :**

Explanation:

- **(a) Pituitary Gland:** Often called the **Master Gland**, it regulates other endocrine



glands and produces growth hormone, TSH, and FSH. It does not directly control the sleep-wake cycle.

- **(b) Thyroid Gland:** Located in the neck, it produces **Thyroxine (T_4)** and **Triiodothyronine (T_3)**, which primarily regulate the body's metabolism, energy levels, and growth.
- **(c) Pineal Gland (Correct):** A small, pinecone-shaped gland located deep in the brain. It secretes the hormone **Melatonin** in response to darkness. This hormone signals to the body that it is time to sleep, thereby regulating the **Circadian Rhythm** (our internal 24-hour clock).
- **(d) Adrenal Gland:** Situated on top of the kidneys, these glands produce hormones like **Adrenaline** (for fight or flight responses) and **Cortisol** (the stress hormone).

63. How many of the following materials can be used as semiconductors?

1. Silicon (Si)
2. Gallium Arsenide (GaAs)
3. Graphite
4. Cadmium Selenide (CdSe)

◦ Select the correct answer using the code given below:

- A. Only one
- B. Only two
- C. Only three
- D. All four

◦ Correct Answer : C

◦ **Answer Justification :**

Explanation:

- **Silicon (Si) [Correct]:** This is the most common **elemental semiconductor**. It belongs to Group 14 of the periodic table and is the primary material used in the fabrication of integrated circuits (ICs) and solar cells.
- **Gallium Arsenide (GaAs) [Correct]:** This is a **compound semiconductor** made from gallium and arsenic. It is preferred over silicon for high-frequency electronics (like satellite communication) and optoelectronics (like LEDs and laser diodes) because it has a direct bandgap.

- **Graphite [Incorrect]:** Graphite is an allotrope of carbon and acts as a **conductor**. Its structure allows for delocalized electrons that move freely between its layers, making it highly conductive.
 - **Note:** While Graphene, a single layer of graphite, has unique electronic properties, bulk graphite is not a semiconductor.

- **Cadmium Selenide (CdSe) [Correct]:** This is a binary **compound semiconductor**. It is widely used in the manufacture of **Quantum Dots** and is essential for medical imaging, light sensors, and next-generation display technologies (QLEDs).

64. With reference to Sodium-ion batteries, consider the following statements:

1. Sodium-ion batteries can be discharged to zero volts during transportation, reducing safety risks.
 2. Sodium-ion batteries use aluminium foil in the anode current collector instead of copper.
 3. Sodium-ion batteries possess higher energy density than lithium-ion batteries.
- Which of the statements given above are correct?
 - A. 1 and 2 only
 - B. 2 and 3 only
 - C. 1 and 3 only
 - D. 1, 2 and 3

◦ Correct Answer : A

◦ **Answer Justification :**

Explanation:

- **Statement 1 is correct:** One of the major logistical advantages of **Sodium-ion (Na-ion)** batteries is that they can be discharged to **zero volts (0V)** for storage and transportation.
 - Unlike Lithium-ion batteries, which must be kept at a partial charge to prevent the copper current collector from dissolving, Na-ion batteries remain stable at 0V. This significantly reduces the risk of thermal runaway or fire during transit.

- **Statement 2 is correct:** At low potentials, sodium does not form an alloy with **aluminium**. This allows manufacturers to use cheaper and lighter aluminium foil for both the cathode and the anode current collectors.

- In contrast, Lithium-ion batteries must use **copper** for the anode because lithium alloys with aluminium at low voltages, which would destroy the battery.
- **Statement 3 is incorrect:** Currently, Sodium-ion batteries have a **lower energy density** (typically 140–160 Wh/kg) compared to high-end Lithium-ion batteries (which can exceed 250 Wh/kg). Because sodium ions are larger and heavier than lithium ions, the batteries are physically bulkier for the same amount of stored energy.
- This makes them less ideal for long-range high-performance EVs but excellent for stationary energy storage and budget electric scooters.

Sodium-ion vs. Lithium-ion

<u>Feature</u>	<u>Sodium-ion (Na-ion)</u>	<u>Lithium-ion (Li-ion)</u>
<u>Abundance</u>	High (Common Salt/Sea water)	Low (Limited)
<u>Current Collector</u>	Aluminium (Both sides)	Copper (Anode) / Aluminium (Cathode)
<u>Transport</u>	Safe at 0V Discharge	Must maintain charge (Safety risk)
<u>Energy Density</u>	Lower	Higher
<u>Cost</u>	20-30% Cheaper	Expensive due to raw materials

65. The “Project Vault”, recently seen in the news, is closely associated with which of the following?

- Select the correct association:
 - A NASA mission to store biological samples from Mars in high-security lunar vaults.
 - A global cybersecurity framework to protect international banking transactions from quantum attacks.
 - A United States initiative to stockpile critical minerals and rare earth elements for strategic industries.
 - A European Union project to create a digital vault for the preservation of cultural heritage using Blockchain.
- Correct Answer : C
- **Answer Justification :**

Explanation:

The United States has launched **Project Vault**, a \$12 billion critical minerals stockpiling initiative, announced by Donald Trump to protect American industries from global supply disruptions.

About Project Vault:

What is Project Vault?

- Project Vault is a public-private stockpiling programme designed to purchase, store, and manage critical minerals and rare earth elements required for strategic civilian and defence industries in the United States, similar in concept to the Strategic Petroleum Reserve.

Launched by:

- **US Government**, announced by **Donald Trump**
- Funded through a mix of **private capital** and the **US Export-Import Bank**

Aim:

- To secure uninterrupted access to critical minerals during global supply shocks.
- To reduce strategic dependence on China, which dominates mineral processing.
- To strengthen national security, advanced manufacturing, and clean energy supply chains.

Key features:

- **Minerals covered:** Rare earths and critical minerals such as **cobalt, gallium**, and other strategic metals
- **Advance purchase commitments:** Companies commit upfront to buy minerals later at fixed inventory prices.
- **Stockpile access model:**
 - Firms can withdraw minerals if they replace equivalent quantities
 - Full access allowed during major supply disruptions
- **Price stabilisation mechanism:** Mandatory repurchase at the same price to reduce

market volatility.

66. With reference to Minor Tectonic Plates, consider the following pairs:

Minor Plate	Location
1. Nazca Plate	Between South America and Pacific Plate
2. Cocos Plate	Between Central America and Pacific Plate
3. Juan de Fuca Plate	North-east of Australia
4. Caroline Plate	Between Philippine Plate and Pacific Plate

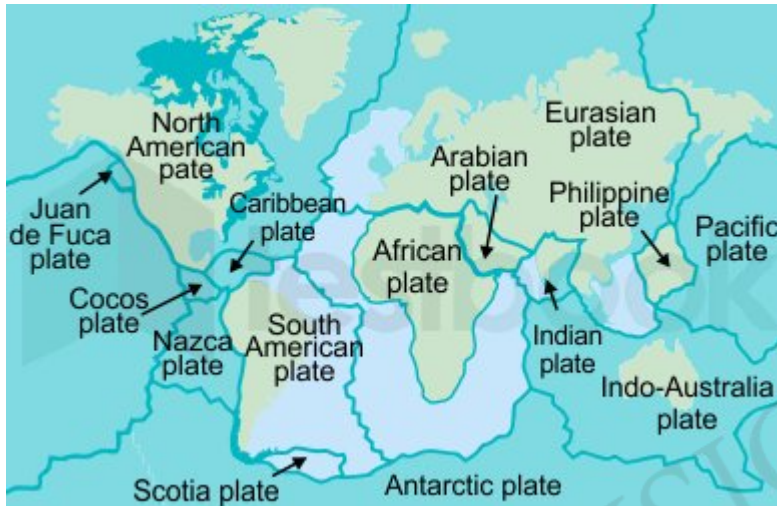
- How many of the above pairs are correctly matched?
 - A. Only one pair
 - B. Only two pairs
 - C. Only three pairs
 - D. All four pairs

◦ Correct Answer : C

◦ **Answer Justification :**

Explanation:

- **Nazca Plate (Correct):** This plate is situated between **South America and the Pacific plate**. It is primarily responsible for the subduction that formed the Andes Mountains along the western coast of South America.
- **Cocos Plate (Correct):** Positioned between **Central America and the Pacific plate**, this minor plate sits just north of the Nazca plate and west of the Caribbean plate.
- **Juan de Fuca Plate (Incorrect):** This plate is located between the **Pacific and North American plates** (specifically off the coasts of Washington, Oregon, and British Columbia).
- **Caroline Plate (correct):** The **Caroline Plate** is a minor tectonic plate located in the Western Pacific. It sits in the area **between the Philippine Sea Plate and the Pacific Plate**, just north of New Guinea.



67. Consider the following statements:

Statement I: The onset of a strong El Niño event is typically characterized by a strengthening of the Walker Circulation.

Statement II: The pressure gradient shifts, resulting in high pressure over Northern Australia and low pressure over the coast of Peru.

- Which of the following is correct with respect to above statements?
 - A. Both Statement I and Statement II are true, and Statement II is the correct explanation of Statement I.
 - B. Both Statement I and Statement II are true, but Statement II is NOT the correct explanation of Statement I.
 - C. Statement I is true, but Statement II is false.
 - D. Statement I is false, but Statement II is true.

◦ Correct Answer : D

◦ **Answer Justification :**

Explanation:

- **Statement I is False:** During a strong El Niño event, the Walker Circulation does not strengthen; instead, it **weakens, collapses, or even reverses**. In a normal year, the Walker Cell is robust due to the significant pressure difference between the Eastern and Western Pacific. El Niño disrupts this balance, leading to a Weak Walker Cell.
- **Statement II is True:** This statement correctly describes the atmospheric shift during El Niño (known as the **Southern Oscillation**). Under normal conditions, there is Low Pressure over Northern Australia/Indonesia and High Pressure over Peru. During El Niño, this pattern flips:



- **Northern Australia/Indonesia:** Experiences higher pressure than normal (leading to drought).
- **Coast of Peru:** Experiences a drop in pressure (leading to heavy rains and convective storms).

68. With reference to drainage patterns, consider the following statements:

1. A drainage pattern is considered antecedent only when it follows the underlying geological structures and surface relief of the region.
 2. Discordant drainage occurs when a river maintains its original course and slope by vertical down-cutting, despite the tectonic uplift of the surrounding land.
- Which of the statements given above is/are correct?
 - A. 1 only
 - B. 2 only
 - C. Both 1 and 2
 - D. Neither 1 nor 2

◦ Correct Answer : D

◦ **Answer Justification :**

Explanation:

The correct answer is (d) Neither 1 nor 2.

- **Statement 1 is Incorrect:** By definition, an **antecedent** drainage pattern is a type of **discordant** drainage. A pattern is only considered *concordant* when it follows the underlying geological structures and surface relief. Since antecedent rivers cut across the structures (like a mountain range) irrespective of the uplift, they do not follow the surface relief.
- **Statement 2 is Incorrect:** While the description of the process (maintaining course via vertical down-cutting despite uplift) is accurate, the terminology is swapped. This specific process describes **Antecedent drainage**, which is a *subset* of discordant drainage. However, Discordant drainage is the broad category that also includes *superimposed* drainage. The statement implies the process is the definition of Discordant drainage as a whole, whereas the process described is uniquely the mechanism of **Antecedent** (or Inconsequent) drainage.

69. Consider the following statements:

Statement I: Areas characterized by temperature inversion often experience reduced vertical dispersion of air pollutants like dust and smoke.

Statement II: An inversion layer acts as a physical cap, limiting convection produced by the heating of air from below.

Statement III: In intermontane valleys, houses and coffee plantations are typically situated on the lower slopes to benefit from the settling cold air.

- Which one of the following is correct in respect of the above statements?
 - A. Both Statement II and Statement III are correct and both of them explain Statement I
 - B. Both Statement II and Statement III are correct but only one of them explains Statement I
 - C. Only one of the Statements II and III is correct and that explains Statement I
 - D. Neither Statement II nor Statement III is correct

◦ Correct Answer : C

◦ **Answer Justification :**

Explanation:

- **Statement I is Correct:** Temperature inversions act as a lid on the atmosphere. Under normal conditions, warm air rises and carries pollutants upward (vertical dispersion). In an inversion, the cold air at the bottom is trapped by the warm air above, concentrating dust, smoke, and smog near the surface.
- **Statement II is Correct and Explains Statement I:** This statement provides the scientific mechanism for Statement I. Convection is the process of warm air rising. Because the air above is even warmer than the air below, the rising air loses its buoyancy and cannot penetrate the warmer layer. This physical cap prevents pollutants from being dispersed into the upper atmosphere.
- **Statement III is Incorrect:** In intermontane valleys, houses and coffee plantations are situated on **upper or middle slopes**, not the lower slopes. The lower slopes and valley bottoms are avoided because cold, dense air drains into them (air drainage), causing intense frost, thick fog, and freezing temperatures—conditions that are harmful to crops like coffee and apples.

70. Which of the following are the major factors influencing the climate of India?

1. The Himalayas
2. Physiography of the subcontinent
3. Monsoon winds
4. Upper air circulation
5. La Niña phenomena

6. Western Disturbances

- Select the correct answer using the code given below:
 - A. Only three
 - B. Only four
 - C. Only five
 - D. All six
- Correct Answer : D
- **Answer Justification :**

Explanation:

- **The Himalayas:** Act as a double-edged sword; they block the cold, biting winds from Central Asia during winter and trap the South-West monsoon winds, ensuring they shed moisture over the Indian landmass.
- **Physiography of the Subcontinent:** Physical features like the Western Ghats (causing orographic rainfall) and the Thar Desert (creating a low-pressure zone) dictate local weather. The relief determines where it rains and where rain-shadow regions exist.
- **Monsoon Winds:** The seasonal reversal of winds is the defining characteristic of our climate. The South-West monsoon brings the bulk of annual rainfall, while the North-East monsoon affects the Coromandel coast.
- **Upper Air Circulation:** The movement of the **Jet Streams** is vital. The Subtropical Westerly Jet influences winter weather, while the Tropical Easterly Jet is closely linked to the intensity of the summer monsoon.
- **La Niña Phenomena:** While occurring in the Pacific, it typically strengthens the Indian monsoon. It leads to lower-than-normal pressures over the Western Pacific/Indian Ocean, generally resulting in better rainfall and colder winters in India.
- **Western Disturbances:** These are shallow cyclonic depressions originating over the Mediterranean Sea. They bring essential winter rain to the North-West parts of India, which is crucial for the **Rabi crops** (especially wheat).

71. With reference to the Indian Ocean Dipole (IOD), consider the following statements:

1. The Indian Ocean Dipole (IOD) is defined by the difference in sea surface temperature between the western Indian Ocean and the eastern Indian Ocean.

2. Positive IOD results in less cyclones than usual in the Arabian Sea.

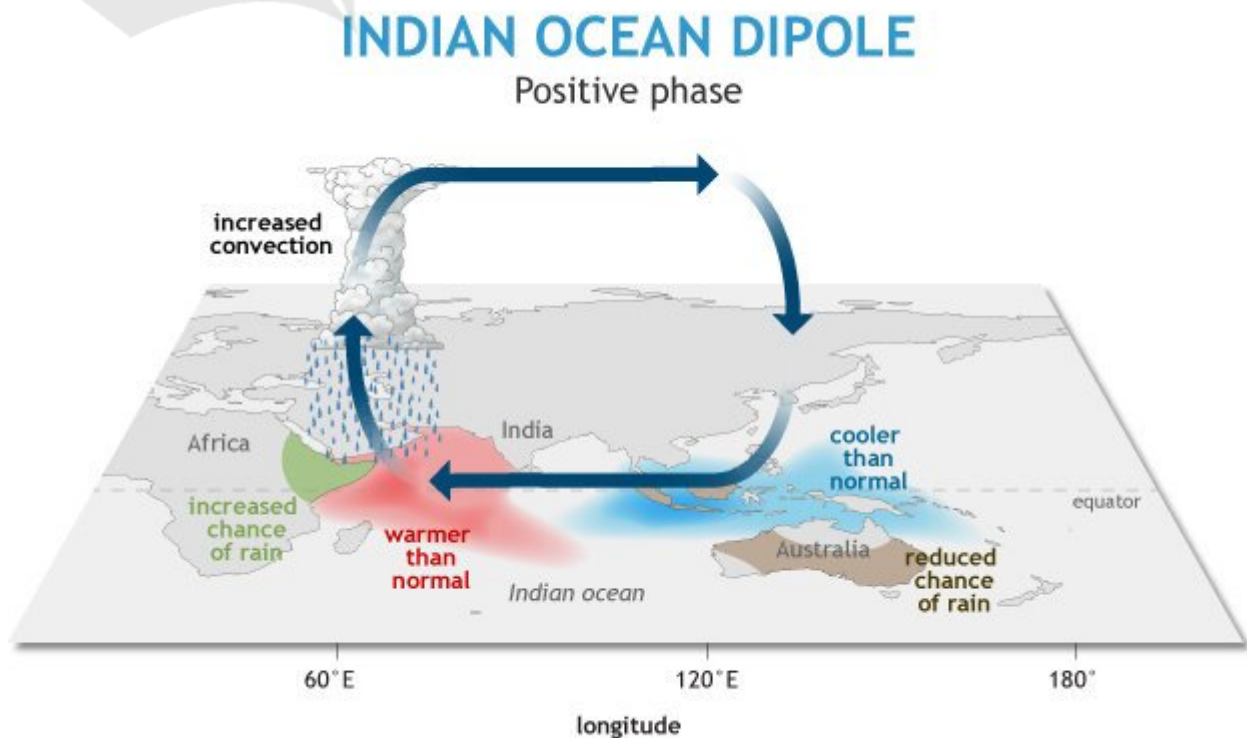
- Which of the statements given above is/are correct?
 - A. 1 only
 - B. 2 only
 - C. Both 1 and 2
 - D. Neither 1 nor 2

◦ Correct Answer : A

◦ **Answer Justification :**

Explanation:

- **Statement 1 is Correct:** This is the standard definition of the IOD. It is a seesaw of sea surface temperatures (SST) between the **western pole** (Arabian Sea near the African coast) and the **eastern pole** (eastern Indian Ocean, south of Indonesia).
- **Statement 2 is Incorrect:** A **Positive IOD** makes the western Indian Ocean (Arabian Sea) **much warmer** than usual. Since warm sea surface temperatures are the primary fuel for cyclogenesis, a positive IOD typically leads to **more** frequent and more intense cyclones in the Arabian Sea, not fewer. Conversely, it brings drought-like conditions to Indonesia and Australia.



NOAA Climate.gov

72. With reference to tropical thorn forests in India, consider the following statements:

1. They are found in regions with less than 50 cm of annual rainfall.
2. They are found in parts of Jharkhand.
3. Khejri and Khair are important plant species of these forests.

◦ Select the answer using the code given below:

- A. I only
- B. I and III
- C. III only
- D. II and III

◦ Correct Answer : B

◦ **Answer Justification :**

Explanation:

- **Statement I is correct:** Tropical thorn forests occur in areas which receive **less than 50 cm** of annual rainfall. Due to the scarcity of water, the plants here have evolved various xerophytic adaptations to minimize transpiration.
- **Statement II is incorrect:** Tropical thorn forests are primarily found in the semi-arid areas of **South-west Punjab, Haryana, Rajasthan, Gujarat, Madhya Pradesh**, and the **leeward side (rain-shadow region) of the Western Ghats. Jharkhand** receives significantly higher rainfall (generally 100 cm to 150 cm) and is dominated by **Tropical Deciduous Forests** (Moist and Dry).
- **Statement III is correct:** The vegetation consists of a variety of grasses and shrubs. Important species include **Khejri** (*Prosopis cineraria*), **Khair**, Babool, Palm, and various types of Cacti. Khejri, in particular, is vital to the ecosystem of the Thar Desert.

73. With reference to tropical cyclones, consider the following statements:

Statement I: Tropical cyclones derive their energy primarily from the latent heat released during condensation of moist air.

Statement II: Tropical cyclones usually weaken rapidly after making landfall.

◦ Which one of the following is correct in respect of the above statements?

- A. Both Statement I and Statement II are correct and Statement II explains Statement I
- B. Both Statement I and Statement II are correct but Statement II does not explain Statement I
- C. Statement I is correct but Statement II is incorrect
- D. Statement I is incorrect but Statement II is correct

◦ Correct Answer : B

◦ **Answer Justification :**

Explanation:

- **Statement I is correct:** Tropical cyclones are essentially heat engines. They thrive on the **latent heat of condensation**. As warm, moist air rises from the ocean surface, it cools and condenses into clouds. This process releases a massive amount of energy (latent heat), which further warms the surrounding air, causing it to rise faster and lowering the surface pressure even more.
- **Statement II is correct:** Once a cyclone moves over land (**landfall**), it rapidly loses its strength. This happens because it is cut off from its primary energy source—the moisture from the warm ocean—and faces increased surface friction from the terrain (buildings, trees, mountains).
- While both statements are scientifically true, **Statement II does not explain Statement I.**
- Statement I explains the **source of energy** (why it grows).
- Statement II explains the **dissipation of energy** (why it dies).
- For Statement II to explain Statement I, it would have to describe the mechanism of latent heat release, which it does not.

74. Consider the following statements regarding earthquakes:

1. Tectonic earthquakes originate due to sliding of rocks along a fault plane.
2. Volcanic earthquake is a special class of tectonic earthquake.
3. The intensity of an earthquake is measured by the Richter scale.

◦ Which of the statements given above are correct?

- A. I and III only
- B. I and II only
- C. II and III only
- D. I, II and III

◦ Correct Answer : B

◦ **Answer Justification :**

Explanation:

- **Statement I is correct:** This describes the most common type of earthquake. **Tectonic earthquakes** occur when accumulated energy is suddenly released due to the sliding of rocks along a **fault plane** (a fracture in the Earth's crust).
- **Statement II is correct:** While often discussed as a separate category in introductory texts, **Volcanic earthquakes** are technically a specialized class of tectonic earthquakes. They are triggered by tectonic displacements specifically related to volcanic activity, such as the movement of magma or the structural collapse of a volcanic dome.
- **Statement III is incorrect: The Richter Scale** measures the **Magnitude** (the amount of energy released at the source). It is a quantitative scale (0–10).
 - **The Mercalli Scale** measures the **Intensity** (the visible damage and impact on people and structures). It is a qualitative scale (I–XII).

75. With reference to the processes of soil formation, consider the following statements:

1. Gleization is a process of soil formation common in humid tropical regions, resulting in the accumulation of iron and aluminum oxides.
 2. Eluviation refers to the removal or leaching of materials from the upper horizon, while illuviation is the deposition of those materials in the lower horizon.
- Which of the statements given above are incorrect?
 - A. I only
 - B. II only
 - C. Both I and II
 - D. Neither I nor II

◦ Correct Answer : A

◦ **Answer Justification :**

Explanation:

- **Statement I is incorrect:** The description provided—the accumulation of iron and aluminum oxides in humid tropical regions—refers to **Laterization** (or Lateralization). In contrast, **Gleization** occurs in waterlogged, anaerobic conditions (such as swamps or areas with high water tables), where the lack of oxygen reduces iron, resulting in a characteristic bluish-grey soil color.

- **Statement II is correct:** This accurately describes the process of translocation within a soil profile. **Eluviation** is the washing out of minerals and nutrients from the upper horizons (typically the A or E horizons), while **Illuviation** is the washing in or accumulation of those materials in the lower layer (typically the B horizon).

76. Consider the following pairs:

Pass	Mountain Range / Region
I. Zoji La	Pir Panjal Range
II. Lipulekh Pass	India-Nepal-China tri-junction
III. Nathu La	Sikkim-Tibet border
IV. Shipki La	Himachal Pradesh-Tibet border
V. Bomdi La	Arunachal Pradesh-Bhutan border

- How many of the above pairs are correctly matched?
 - A. Only two
 - B. Only three
 - C. Only four
 - D. All the five
- Correct Answer : B
- **Answer Justification :**

Explanation

Pair I - Incorrect- Zoji La lies in the **Great Himalayan Range**, connecting **Kashmir Valley with Ladakh** on the **Srinagar-Leh highway**. It is often mistakenly associated with the **Pir Panjal Range**, which lies south of the Kashmir Valley.

Pair II - Correct- Lipulekh Pass is located near the **tri-junction of India (Uttarakhand), Nepal and China (Tibet)**. It is historically important for **Kailash-Mansarovar pilgrimage** and Indo-Tibetan trade routes.

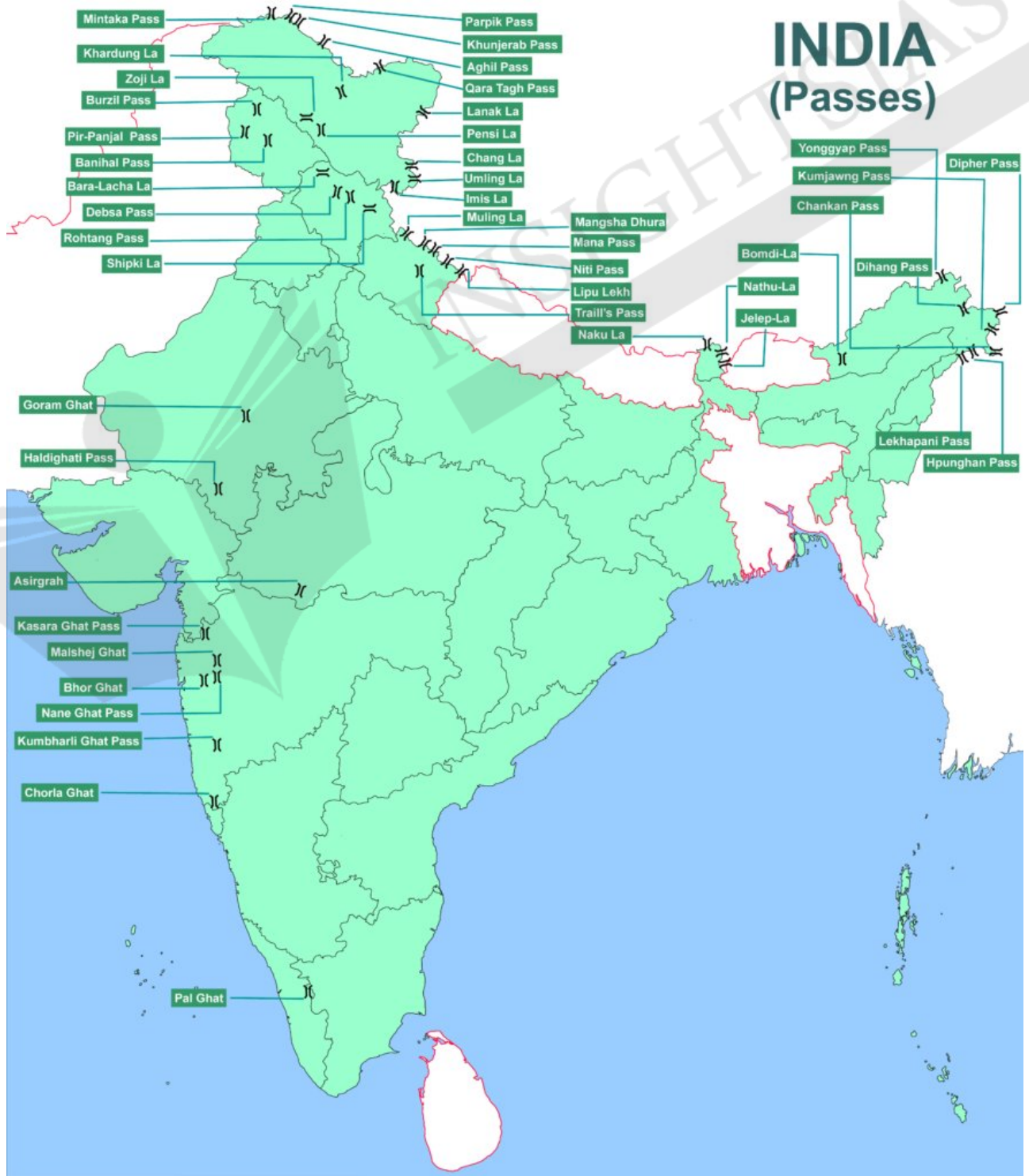
Pair III - Correct- Nathu La is a strategic pass in **Sikkim on the India-Tibet border**. It forms part of the **ancient Silk Route** and was reopened for **border trade between India and China in 2006**.

Pair IV - Correct- Shipki La lies on the **India-Tibet border in Himachal Pradesh** in the **Kinnaur region**. It historically served as an **Indo-Tibetan trade route** along the Sutlej valley.

Pair V - Incorrect

Bomdi La is located in **Arunachal Pradesh**, but it lies in the **Eastern Himalayas within India**, not on the **India-Bhutan border**.

Thus, **three pairs are correctly matched**.



77. With reference to Lake Turkana, consider the following statements:

1. It is the world's largest permanent desert lake.
 2. It lies mainly in Ethiopia, with its southern tip extending into Kenya.
 3. The Omo River contributes the majority of inflow into the lake.
 4. The Lake Turkana National Parks were inscribed on the UNESCO World Heritage List in 1997.
- How many of the above statements are correct?
 - A. Only one
 - B. Only two
 - C. Only three
 - D. All the four

◦ Correct Answer : C

◦ **Answer Justification :**

Statement 1 is correct-Lake Turkana, located in the arid region of East Africa, is widely recognised as the **largest permanent desert lake in the world**. It is also the **largest alkaline lake globally**, characterised by high salinity and alkalinity due to intense evaporation and limited outflow in a desert climate.

Statement 2 is incorrect- The lake lies **primarily in northwestern Kenya**, while only its **northernmost tip extends into Ethiopia**. Therefore, the statement reverses the correct geographical position.

Statement 3 is correct- The **Omo River**, which originates in the Ethiopian Highlands, supplies **over 90% of the inflow** to Lake Turkana. Consequently, hydrological changes or dam projects on the Omo River significantly influence the lake's water level and ecological balance.

Statement 4 is correct- The **Lake Turkana National Parks**—comprising **Sibilo National Park, Central Island National Park and South Island National Park**—were **inscribed on the UNESCO World Heritage List in 1997**. These parks are recognised for their exceptional biodiversity, geological formations and rich fossil records associated with early human evolution.

Thus, **three statements are correct**.



78. Consider the following statements regarding the distribution of insolation on the Earth's surface:

1. The equatorial region receives the maximum insolation because the Sun's rays fall vertically throughout the year.
2. Subtropical desert regions receive higher insolation than the equatorial region due to clearer skies and lower cloud cover.
3. At the same latitude, continental surfaces generally receive more insolation than oceanic surfaces.

◦ Which of the statements given above are correct?

- A. 1 and 2 only
- B. 2 and 3 only
- C. 1 and 3 only
- D. 1, 2 and 3

◦ Correct Answer : B

◦ **Answer Justification :**

Explanation

The distribution of **insolation (incoming solar radiation)** on the Earth's surface depends not only on the **angle of incidence of the Sun's rays** but also on **atmospheric conditions, cloud cover, and the nature of the surface**.

Statement 1 - Incorrect

Although the equatorial region receives nearly **vertical Sun rays throughout the year**, the area is characterized by **high humidity, frequent cloud cover, and intense convective rainfall**. These conditions reduce the amount of solar radiation reaching the surface, so the

equator does **not record the highest surface insolation.**

Statement 2 - Correct

Subtropical desert regions (around **20°-30° latitude**) are located under **subtropical high-pressure belts**. These areas typically experience **clear skies, low humidity, and minimal cloud cover**, allowing a greater proportion of solar radiation to reach the ground. Hence deserts such as the **Sahara, Arabian, and Atacama** record some of the **highest insolation values on Earth.**

Statement 3 - Correct

At the same latitude, **continental surfaces generally receive more effective insolation than oceans**. Water has **higher specific heat capacity**, greater **transparency**, and undergoes **vertical mixing**, which distributes heat to deeper layers. Land surfaces, in contrast, absorb heat more quickly at the surface.

Hence, only **statements 2 and 3 are correct.**

79. Consider the following pairs regarding local winds and pre-monsoon weather phenomena in India:

Wind/Phenomenon	Region/Effect
A. Loo	Coffee blossom showers in Karnataka
B. Kalbaisakhi	Hot, dry winds in the northern plains
C. Mango Showers	Pre-monsoon showers in Kerala and Karnataka
D. Cherry Blossom	Thunderstorms in West Bengal and Assam

- How many of the pairs given above are incorrectly matched?
 - A. One only
 - B. Two only
 - C. Three only
 - D. None of the above

○ Correct Answer : C

○ **Answer Justification :**

Pair A - Incorrect

Loo refers to **hot, dry and dust-laden winds** that blow across the **northern plains of India** during the pre-monsoon months of **May and June**. These winds often raise temperatures above **45°C** and can cause heat strokes. They are not related to coffee cultivation.

Pair B - Incorrect

Kalbaisakhi, also known as **Nor'westers**, are **violent pre-monsoon thunderstorms** that occur mainly in **West Bengal, Assam, and Bangladesh** during **April-May**. They bring heavy

rain, strong winds, and lightning, providing temporary relief from heat.

Pair C - Correct

Mango Showers are **pre-monsoon convective rains** that occur mainly in **Kerala and coastal Karnataka during March-April**. These showers help in the **early ripening of mangoes**, hence the name.

Pair D - Incorrect

Cherry Blossom showers, also known as **coffee blossom showers**, occur in the **coffee-growing regions of Karnataka** (such as Coorg, Chikmagalur, and Hassan). These rains help trigger **flowering in coffee plants**, which is essential for a good harvest. They are not associated with thunderstorms in eastern India.

Thus, **three pairs (A, B, and D) are incorrectly matched.**

80. Consider the following hill ranges:

1. Mahendragiri Hills
2. Nallamala Hills
3. Anaimalai Hills
4. Javadi Hills
5. Cardamom Hills
6. Nilgiri Hills

- How many of the above-mentioned hill ranges are not a part of the Western Ghats?
 - A. Only two
 - B. Only three
 - C. Only four
 - D. Only five

- Correct Answer : B

- **Answer Justification :**

Explanation

The **Western Ghats** form a continuous mountain chain along the **western edge of the Deccan Plateau**, extending from **Gujarat to Kerala and Tamil Nadu**. Several hill ranges in peninsular India belong either to the **Western Ghats** or the **Eastern Ghats**.

1. Mahendragiri Hills — Not part of Western Ghats

Located in the **Eastern Ghats** in the **Odisha-Andhra Pradesh region**.

2. Nallamala Hills — Not part of Western Ghats

Part of the **Eastern Ghats**, located mainly in **Andhra Pradesh and Telangana**. The **Nagarjunasagar-Srisailem Tiger Reserve** lies in this range.

3. Anaimalai Hills – Part of Western Ghats

Located on the **Kerala-Tamil Nadu border**. The range includes **Anamudi (2695 m)**, the **highest peak of peninsular India**.

4. Javadi Hills – Not part of Western Ghats

Situated in **northern Tamil Nadu** and form a part of the **Eastern Ghats**.

5. Cardamom Hills – Part of Western Ghats

Located in **Kerala**, forming the southern section of the Western Ghats.

6. Nilgiri Hills – Part of Western Ghats

A major segment of the **Western Ghats**, located at the tri-junction of **Tamil Nadu, Kerala, and Karnataka**.

Thus, the hill ranges **not belonging to the Western Ghats** are:

- **Mahendragiri Hills**
- **Nallamala Hills**
- **Javadi Hills**

Hence, the correct answer is **(b) Only three**.

81. Consider the following statements:

Statement-I: The Standing Deposit Facility (SDF) rate serves as the floor of the Reserve Bank of India's Liquidity Adjustment Facility corridor.

Statement-II: The SDF was introduced because, unlike the Reverse Repo, it does not require the transfer of government securities as collateral from the Reserve Bank to commercial banks.

Statement-III: When the RBI narrows the LAF corridor by reducing the spread between the SDF rate and the Marginal Standing Facility rate, it results in greater volatility in short-term interest rates.

- Which one of the following is correct in respect of the above statements?
 - A. Statements I and II are correct, but Statement III is incorrect
 - B. Statements I and III are correct, but Statement II is incorrect
 - C. All three statements are correct
 - D. Only Statement I is correct
- Correct Answer : A

○ Answer Justification :

Statement-I: CORRECT Since April 2022, the SDF rate has replaced the Reverse Repo rate as the floor of the LAF corridor. The corridor now runs: SDF rate (floor) → Repo rate (policy

rate, centre) → MSF rate (ceiling). Banks park excess liquidity with RBI at the SDF rate and borrow from RBI at the MSF rate.

Statement-II: CORRECT and explains the rationale for SDF This is the key operational advantage. Under the Reverse Repo, RBI had to transfer government securities to the depositing bank as collateral, which limited absorption capacity to RBI's stock of securities. The SDF, introduced under Section 17(3A) of the RBI Act (amended in 2018), requires no collateral exchange. This gives RBI unconstrained liquidity absorption capacity — a critical tool during the post-pandemic liquidity surplus era.

Statement-III: INCORRECT — the causal chain is inverted A *narrower* corridor actually results in *lower* volatility in short-term rates, not greater volatility. The corridor acts as a band within which the weighted average call rate (WACR) fluctuates. A narrower band constrains the range of fluctuation, reducing volatility. Widening the corridor — increasing the spread — would permit greater volatility. The statement inverts the relationship between corridor width and rate volatility.

82. Consider the following:

1. Market borrowings through dated government securities
 2. External borrowings from multilateral institutions
 3. Short-term borrowings through Treasury Bills
- How many of the above are included while computing the fiscal deficit of the Union Government?
 - A. Only one
 - B. Only two
 - C. All three
 - D. None
 - Correct Answer : C

◦ **Answer Justification :**

Item 1 — Market borrowings (dated G-Secs): INCLUDED

Dated government securities are the primary instrument for financing the fiscal deficit. These are debt-creating capital receipts — borrowings that create a liability for the government. They are part of total borrowings that constitute the gap between total expenditure and total non-debt receipts.

Item 2 — External borrowings from multilateral institutions: INCLUDED External borrowings (from World Bank, ADB, bilateral sources) are debt-creating capital receipts. They create a government liability and are part of the total borrowings that constitute the fiscal deficit.

Item 3 — Treasury Bills: INCLUDED

T-Bills are short-term borrowing instruments of the government (91-day, 182-day, 364-day). They are debt obligations that finance the deficit. While they are money market instruments, they represent government borrowings and are included in deficit financing.

83. Consider the following:

Scheme/Initiative	Nodal Ministry/Department	Primary Objective
1. Production Linked Incentive (PLI) for Electronics	Ministry of Electronics and Information Technology	Boost domestic manufacturing of electronics and semiconductors
2. Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (PM-JAY)	Ministry of Health and Family Welfare	Provide health insurance coverage of ₹5 lakh per family per year
3. PM Vishwakarma	Ministry of Micro, Small and Medium Enterprises	Provide end-to-end support to artisans and craftspeople through recognition, skilling, and credit
4. Samarth - Scheme for Capacity Building in Textile Sector	Ministry of Commerce and Industry	Skill development in the textile and apparel sector

- How many of the above rows are correctly matched in respect of both the Nodal Ministry and the Primary Objective?
 - A. Only one
 - B. Only two
 - C. Only three
 - D. All four

◦ Correct Answer : B

◦ **Answer Justification :**

Row 1 – PLI for Electronics: CORRECT

The PLI scheme for Large Scale Electronics Manufacturing is administered by the Ministry of Electronics and Information Technology (MeitY). Its primary objective is to boost domestic manufacturing of electronic components and devices, attract global investments, and create a competitive manufacturing ecosystem. The semiconductor component is under a separate India Semiconductor Mission, but MeitY is the nodal ministry for both. Both columns are accurate.

Row 2 – PM-JAY: CORRECT

Ayushman Bharat PM-JAY is administered by the Ministry of Health and Family Welfare through the National Health Authority (NHA). It provides cashless health insurance coverage

of ₹5 lakh per family per year for secondary and tertiary care hospitalization to approximately 12 crore poor and vulnerable families. Both columns are accurate.

Row 3 – PM Vishwakarma: INCORRECT (Ministry is wrong) This is the partial-match.

The Primary Objective is correctly described — PM Vishwakarma does provide end-to-end support to traditional artisans and craftspeople through recognition, skilling, toolkit incentives, and credit support. However, the Nodal Ministry is wrong. PM Vishwakarma is administered by the **Ministry of Skill Development and Entrepreneurship**, not the Ministry of MSME. The MSME ministry handles general micro/small/medium enterprise policies, while PM Vishwakarma specifically targets traditional artisans through a skilling-first approach, placing it under Skill Development.

Row 4 – Samarth: INCORRECT □ (Ministry is wrong)

The Primary Objective is correctly described — Samarth is a capacity building and skill development scheme for the textile sector. However, it is administered by the **Ministry of Textiles**, not the Ministry of Commerce and Industry. The Commerce and Industry ministry handles trade policy, not sector-specific skill development.

84. With reference to the Minimum Support Price (MSP) in India, consider the following statements:

1. The Commission for Agricultural Costs and Prices recommends the MSP for various crops, and the final decision on MSP is taken by the Cabinet Committee on Economic Affairs.
 2. The MSP is currently announced for 20 mandatory crops and sugarcane, covering both kharif and rabi seasons.
- Which of the statements given above is/are correct?
 - A. 1 only
 - B. 2 only
 - C. Both 1 and 2
 - D. Neither 1 nor 2

◦ Correct Answer : A

◦ **Answer Justification :**

Statement 1: CORRECT

The Commission for Agricultural Costs and Prices (CACP), an attached office of the Ministry of Agriculture and Farmers' Welfare, recommends MSP for 23 crops. The CCEA (Cabinet Committee on Economic Affairs), chaired by the Prime Minister, takes the final decision on MSP based on CACP recommendations. This two-step process — CACP recommends, CCEA approves — is well-established.

Statement 2: INCORRECT

The number is close but wrong. MSP is announced for **23 crops** (not 20): 7 cereals, 5 pulses, 7

oilseeds, and 4 commercial crops. Sugarcane's price is determined separately as the Fair and Remunerative Price (FRP) by CACP and fixed by the government — it is not classified under the 23 MSP crops but is in addition to them. MSP is a price assurance, not a mandatory procurement obligation (there is no legal mandate for government to procure at MSP for all 23 crops).

85. Consider the following statements:

Statement-I: India's current account deficit tends to widen during periods of high global crude oil prices.

Statement-II: Crude oil constitutes a significant share of India's merchandise imports, and higher oil prices increase the import bill without a corresponding increase in export earnings in the short run.

- Which one of the following is correct in respect of the above statements?
 - A. Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
 - B. Both Statement-I and Statement-II are correct but Statement-II is NOT the correct explanation for Statement-I
 - C. Statement-I is correct but Statement-II is incorrect
 - D. Statement-I is incorrect but Statement-II is correct

◦ Correct Answer : A

◦ **Answer Justification :**

Statement-I: CORRECT India is a net oil importer, importing roughly 85 per cent of its crude oil requirements. When global crude prices rise, the petroleum import bill increases substantially, widening the trade deficit and consequently the current account deficit. This relationship is well-documented across multiple episodes (2008, 2013, 2018, 2022).

Statement-II: CORRECT and IS the correct explanation Crude oil and petroleum products constitute approximately 25-30 per cent of India's total merchandise import bill. Higher oil prices directly inflate the import side of the trade balance. In the short run, India's export basket (services, engineering goods, pharmaceuticals, gems & jewellery) does not benefit proportionately from oil price increases. Some petroleum product exports may increase in value, but the net effect is strongly negative. The causal chain is direct: higher oil prices → higher import bill → wider trade deficit → wider CAD.

86. Consider the following statements:

Statement-I: The Government of India has issued sovereign green bonds to finance public sector projects that contribute to the reduction of carbon intensity of the economy.

Statement-II: Sovereign green bonds typically carry a lower coupon rate than comparable conventional government securities because investor demand for environmentally labelled instruments creates a pricing advantage known as the greenium.

Statement-III: The proceeds from sovereign green bonds can be used for any expenditure classified under the capital budget of the Union Government, provided the relevant ministry certifies the environmental benefit.

- Which one of the following is correct in respect of the above statements?
 - A. Statements I and II are correct, but Statement III is incorrect
 - B. All three statements are correct
 - C. Statements I and III are correct, but Statement II is incorrect
 - D. Only Statement I is correct

◦ Correct Answer : A

◦ **Answer Justification :**

Statement-I: CORRECT

India issued its first sovereign green bonds in January 2023, raising ₹16,000 crore in two tranches. The stated objective is to mobilize resources for green infrastructure investment and reduce the carbon intensity of the economy, in line with India's Panchamrit climate commitments and Nationally Determined Contributions under the Paris Agreement.

Statement-II: CORRECT Sovereign green bonds have indeed been issued at coupon rates slightly lower than comparable conventional government securities. This pricing advantage — the "greenium" — arises because dedicated ESG and green investors are willing to accept marginally lower returns for the environmental labelling and the eligible use-of-proceeds framework. India's green bonds achieved a greenium of approximately 5-6 basis points in initial issuances. This lowers the government's borrowing cost for green expenditure.

Statement-III: INCORRECT

This statement sounds reasonable but fundamentally mischaracterizes the green bond framework. Proceeds from sovereign green bonds are NOT available for general capital expenditure. They are earmarked exclusively for eligible green expenditure categories defined in the Government of India's Green Bond Framework: renewable energy, energy efficiency, clean transportation, climate change adaptation, sustainable water management, pollution prevention, and green buildings. A generic "ministry certification" process does not exist — the eligible categories are pre-defined, and the framework requires third-party verification and annual allocation reporting. The statement uses current-affairs-sounding language to attribute a general-purpose flexibility that the instrument explicitly prohibits.

- 87.** With reference to Non-Banking Financial Companies (NBFCs) in India, consider the following statements:
1. The Reserve Bank of India classifies NBFCs into different layers based on their size, activity, and perceived riskiness under the Scale Based Regulation framework.
 2. All categories of NBFCs registered with the Reserve Bank of India are permitted to accept public deposits.
 3. The upper layer of NBFCs under the Scale Based Regulation framework is subject to enhanced regulatory requirements comparable to those applicable to scheduled commercial banks.
- Which of the statements given above is/are correct?
 - A. 1 only

- B. 1 and 3 only
- C. 2 and 3 only
- D. 1, 2 and 3

◦ Correct Answer : B

◦ **Answer Justification :**

Statement 1: CORRECT

RBI introduced the Scale Based Regulation (SBR) framework for NBFCs effective October 2022. It classifies NBFCs into four layers: Base Layer (NBFC-BL), Middle Layer (NBFC-ML), Upper Layer (NBFC-UL), and Top Layer (NBFC-TL). Classification is based on size (asset base), activity type, and perceived riskiness. Regulatory intensity increases progressively with each layer.

Statement 2: INCORRECT

Only a very limited category of NBFCs — specifically, NBFC-Deposit taking companies (NBFC-D) — are permitted to accept public deposits, and even they are subject to strict conditions including investment-grade credit rating and compliance with RBI deposit directions. The vast majority of NBFCs are non-deposit-taking (NBFC-ND).

Statement 3: CORRECT

Upper Layer NBFCs face regulatory requirements significantly more stringent than those in the Base or Middle layers. These include bank-like requirements such as differential standard asset provisioning, board composition norms, large exposure framework compliance, and mandatory listing requirements (for those meeting size thresholds). The regulatory intensity is designed to be comparable to commercial bank standards given the systemic importance of these large NBFCs.

88. With reference to Legal Entity Identifier (LEI), consider the following statements:

1. It is a 20-digit unique code to identify parties to financial transactions worldwide to improve the quality of financial data.
2. In India, the RBI has mandated LEI for all non-individual borrowers having aggregate exposure of ₹5 crore and above from banks and financial institutions.
3. Individual borrowers taking personal home loans are also required to obtain an LEI.

◦ Which of the statements given above are correct?

- A. 1 and 2 only
- B. 2 and 3 only
- C. 1 and 3 only
- D. 1, 2, and 3

◦ Correct Answer : A

◦ **Answer Justification :**

Explanation

The **Legal Entity Identifier (LEI)** is a global reference data system that uniquely identifies every legal entity that is a party to a financial transaction. It was developed by the G20 in response to the 2008 financial crisis to increase transparency in the global marketplace.

- **Statement 1 is correct:** The LEI is a **20-digit, alpha-numeric code** based on the ISO 17442 standard. It connects to a high-quality reference data pool (the Global LEI Index), allowing for the clear and unique identification of legal entities participating in financial transactions.
- **Statement 2 is correct:** In India, the Reserve Bank of India (RBI) has introduced the LEI in a phased manner. It is mandatory for **non-individual borrowers** (corporates, partnership firms, etc.) having an aggregate exposure (both fund-based and non-fund-based) of **₹5 crore and above** from banks and financial institutions.
- **Statement 3 is incorrect:** The LEI is intended strictly for **legal entities** (entities that enter into legal contracts). It is **not required for individual borrowers**, regardless of the size of their personal loans, such as home loans or car loans.

89. Consider the following financial instruments:

1. Commercial Paper issued by a corporation with a maturity upto 1 year
2. Certificate of Deposit issued by a scheduled commercial bank with a maturity of 14 months
3. Treasury Bills issued by the Reserve Bank of India on behalf of the Government of India
4. Repurchase agreements with an overnight tenor between commercial banks

◦ How many of the above are money market instruments?

- A. Only one
- B. Only two
- C. Only three
- D. All four

◦ Correct Answer : C

◦ **Answer Justification :**

Item 1 – Commercial Paper : MONEY MARKET

Commercial Paper is a short-term unsecured promissory note issued by highly rated corporates, with maturity ranging from 7 days to 1 year. CP is a well-established money market instrument traded in the Indian money market, regulated by RBI.

Item 2 – Certificate of Deposit (14-month maturity): NOT MONEY MARKET

Certificates of Deposit issued by scheduled commercial banks can have a maturity ranging from 7 days to 1 year. At 14 months, this CD has crossed the 1-year boundary and would not qualify as a standard money market instrument. The money market, by definition, deals in short-term instruments with maturity up to 1 year. A 14-month CD pushes into the capital market territory.

Item 3 – Treasury Bills: MONEY MARKET

Treasury Bills are the quintessential money market instrument – short-term government securities issued in three tenors: 91-day, 182-day, and 364-day. They are issued by RBI on behalf of the Government of India and are sold at a discount to face value.

Item 4 – Overnight Repos: MONEY MARKET

Repurchase agreements (repos) are a core money market instrument, particularly at the overnight tenor. Overnight repos between banks are traded in the money market and form the basis of the call money market's liquidity dynamics. The repo rate itself is the benchmark policy rate for the money market.

90. Consider the following:

Institution	Headquarters	Primary Lending Focus
1. New Development Bank (NDB)	Shanghai, China	Infrastructure and sustainable development in BRICS and other emerging economies
2. Asian Infrastructure Investment Bank (AIIB)	Beijing, China	Infrastructure connectivity and development across Asia and beyond
3. International Fund for Agricultural Development (IFAD)	Washington, D.C., USA	Rural development and agricultural transformation in developing countries
4. Asian Development Bank (ADB)	Tokyo, Japan	Poverty reduction and economic development in the Asia-Pacific region

- How many of the above rows are correctly matched in respect of both the Headquarters and the Primary Lending Focus?
 - A. Only one
 - B. Only two
 - C. Only three
 - D. All four
- Correct Answer : B

◦ **Answer Justification :**

Row 1 – NDB: CORRECT

The New Development Bank (formerly the BRICS Development Bank) is headquartered in Shanghai, China. It was established by the BRICS nations in 2014 (operational from 2015) to mobilize resources for infrastructure and sustainable development projects in BRICS and other emerging market economies. It has since expanded membership beyond BRICS (Bangladesh, UAE, Egypt, Uruguay are new members). Both the headquarters and lending focus are accurately stated.

Row 2 – AIIB: CORRECT

The Asian Infrastructure Investment Bank is headquartered in Beijing, China. It was established in 2016 as a multilateral development bank focused on infrastructure investment – transport, energy, telecommunications, urban development, and cross-border connectivity. While Asia-focused, it has expanded to fund projects in non-Asian member countries. Both columns are accurate.

Row 3 – IFAD: INCORRECT (Headquarters is wrong)

The lending focus is correctly described – IFAD does focus on rural development, smallholder agriculture, and food security in developing countries. However, IFAD is headquartered in **Rome, Italy**, not Washington, D.C. IFAD is a specialized agency of the United Nations, and like other Rome-based UN food agencies (FAO, WFP), it is based in Rome.

Row 4 – ADB: INCORRECT (Headquarters is wrong)

The lending focus is correctly described – ADB's stated mission is to reduce poverty and promote economic and social development in Asia-Pacific. However, ADB is headquartered in **Manila, Philippines**, not Tokyo, Japan. Japan is the largest shareholder of ADB and the ADB president has historically been Japanese, which creates a strong but incorrect association with Tokyo.

91. With reference to the changes introduced in the Consumer Price Index (CPI) series with base year 2024, consider the following statements:

1. The number of weighted items in the CPI basket has been increased from 299 to 358, which includes the addition of online media and streaming services.
2. For the first time, house rent data for rural areas has been included in the computation of the Housing index.
3. The earlier classification structure of six broad groups has been replaced with a structure of eight divisions for greater granularity.

◦ Which of the statements given above is/are correct?

- A. 1 only
- B. 1 and 3 only
- C. 1 and 2 only

D. 2 and 3 only

◦ Correct Answer : C

◦ **Answer Justification :**

Statement 1 – CORRECT. The number of weighted items has increased from 299 (CPI 2012) to 358 (CPI 2024), comprising 308 goods and 50 services. New items include online media and streaming services (OTT subscriptions), rural house rent, value-added dairy, fitness equipment, and pen drives. Obsolete items like VCR/DVD players and tape recorders have been removed.

Statement 2 – CORRECT. For the first time, rural house rent has been included in the CPI Housing index. The earlier series predominantly measured urban rent. The rural housing weight in CPI 2024 is 11.764%. A total of 3,324 rural dwellings and 15,715 urban dwellings have been identified for rent data collection.

Statement 3 – INCORRECT. The earlier CPI 2012 structure had six broad groups. The revised CPI 2024 series replaces this with **12 divisions** (not eight) as per the COICOP 2018 framework. The hierarchy runs: 12 divisions → 43 groups → 92 classes → 162 sub-classes → 358 items.

92. In a hypothetical economy, the following data are available for a given year (in ₹ crore):

- Private Final Consumption Expenditure (PFCE): 120
- Government Final Consumption Expenditure (GFCE): 40
- Gross Fixed Capital Formation (GFCF): 60
- Change in Stocks: 5
- Exports: 30
- Imports: 45
- Old-age pension payments by the government: 10
- Purchase of second-hand machinery by a firm: 8

◦ What is the GDP at market prices by the expenditure method?

- A. ₹ 221 crore
- B. ₹ 219 crore
- C. ₹ 211 crore
- D. ₹ 210 crore

◦ Correct Answer : D

◦ **Answer Justification :**

GDP (Expenditure Method) = PFCE + GFCE + GFCF + Change in Stocks + (Exports - Imports)

Applying the values: = $120 + 40 + 60 + 5 + (30 - 45) = 120 + 40 + 60 + 5 + (-15) = ₹ 210$ crore

Now, the critical inclusion/exclusion reasoning:

Old-age pension (₹ 10 crore) — EXCLUDED. Pensions are transfer payments by the government. They do not correspond to any current production of goods or services. Transfer payments are not a factor payment and therefore are not included in GDP. This amount is already excluded — it is NOT part of GFCE. GFCE covers only government consumption of goods and services, not transfers.

Purchase of second-hand machinery (₹ 8 crore) — EXCLUDED. Second-hand goods were already counted in GDP when originally produced. Resale does not constitute new production and is therefore excluded from GDP. This is NOT part of GFCF.

93. With reference to the recently revised GDP series with base year 2022-23, sometimes mentioned in news, consider the following statements:

1. When the nominal GDP estimated under the new series is lower than the earlier series while the absolute fiscal deficit remains unchanged, the fiscal deficit-to-GDP ratio increases.
2. The new GDP series has adopted the double deflation method for manufacturing, in which both inputs and outputs are deflated separately using their respective price indices.
3. The new GDP series has shifted the base year from 2011-12 to 2022-23 primarily because the year 2021-22 was considered unsuitable due to sharp recovery-driven GDP growth from a low COVID-era base.

◦ Which of the statements given above is/are correct?

- A. 1, 2 and 3
- B. 1 and 2 only
- C. 2 and 3 only
- D. 1 only

◦ Correct Answer : A

◦ **Answer Justification :**

Statement 1 — CORRECT. Since Fiscal Deficit-to-GDP ratio = $(\text{Absolute Fiscal Deficit} \div \text{Nominal GDP}) \times 100$, a lower nominal GDP in the denominator automatically pushes the ratio upward even when the numerator remains unchanged. Under the new GDP series, India's nominal GDP for FY26 was revised downward by approximately 3.3%, causing the fiscal deficit ratio to rise from 4.36% to 4.51% despite no change in the absolute deficit amount.

Statement 2 – CORRECT. The new GDP series has adopted the double deflation method for manufacturing. Under the earlier single deflation approach, a single price index was used to convert nominal GVA to real GVA. Under double deflation, gross output and intermediate consumption are each deflated separately using their respective price indices. This provides a more accurate measure of real value added, especially when input and output prices move differently — a common occurrence in manufacturing supply chains.

Statement 3 – CORRECT. MoSPI and the Advisory Committee on National Accounts Statistics explicitly identified 2021-22 as unsuitable because its sharp GDP growth (8.7%) was largely driven by the low-base effect of the COVID-19 contraction in the preceding years. Such distorted recovery-year data would have produced an unrepresentative reference framework. FY 2022-23 was selected as it was considered a "normal" post-COVID year with comprehensive and robust data availability across sectors.

94. In a hypothetical economy, Gross GST collections increased from ₹12 lakh crore to ₹15 lakh crore during a financial year, while the nominal GDP of the economy grew from ₹250 lakh crore to ₹275 lakh crore during the same period. Consider the following statements:

1. The tax buoyancy of GST for this period is 2.5.
 2. A tax buoyancy greater than 1 implies that the tax revenue is growing at a rate faster than the rate of growth of nominal GDP.
 3. A tax buoyancy greater than 1 can result only from an increase in the applicable tax rates.
- Which of the statements given above is/are correct?
 - A. 1 only
 - B. 2 and 3 only
 - C. 1 and 2 only
 - D. 1, 2 and 3

◦ Correct Answer : C

◦ **Answer Justification :**

Statement 1 – CORRECT.

Tax Buoyancy = (% change in Tax Revenue) ÷ (% change in Nominal GDP)

% change in GST collections = $[(15 - 12) \div 12] \times 100 = 25 \text{ per cent}$
% change in Nominal GDP = $[(275 - 250) \div 250] \times 100 = 10 \text{ per cent}$

Tax Buoyancy = $25 \div 10 = 2.5$

Statement 2 – CORRECT. By definition, tax buoyancy measures the responsiveness of tax revenue to changes in GDP. A buoyancy ratio greater than 1 means that for every 1 per cent growth in nominal GDP, tax revenue grows by more than 1 per cent — i.e., tax revenue is growing faster than the economy. This is generally considered a desirable outcome for government finances.

Statement 3 – INCORRECT. Tax buoyancy greater than 1 does NOT necessarily result from rate increases. Buoyancy captures the *total* change in tax revenue relative to GDP growth, which can be driven by multiple factors beyond rate hikes:

- **Improved compliance and anti-evasion measures** (e-invoicing, e-way bills reducing tax leakage)
- **Formalization of the economy** (more businesses entering the GST net)
- **Base broadening** (more goods and services brought under tax coverage)
- **Better data analytics** by the GST Network detecting mismatches
- **Rising consumption patterns** in higher-taxed categories

This is precisely the distinction between *tax buoyancy* and *tax elasticity*. Tax elasticity measures the automatic or built-in response of tax revenue to GDP growth *holding tax rates constant* (i.e., without any discretionary changes). Tax buoyancy, on the other hand, measures the *total* response including both automatic and discretionary changes. India's GST buoyancy has consistently exceeded 1 in recent years — driven largely by improved compliance and formalization rather than rate increases.

- 95.** With reference to the Social Stock Exchange (SSE) established in India, consider the following statements:
1. The Social Stock Exchange operates as a separate segment within a recognized stock exchange and is regulated by the Securities and Exchange Board of India.
 2. Both for-profit social enterprises and not-for-profit organizations are eligible to register on the Social Stock Exchange, provided they meet the specified social impact criteria.
 3. Not-for-profit organizations listed on the Social Stock Exchange can raise funds only through equity instruments similar to those used in the main stock exchange.
- Which of the statements given above is/are correct?
 - A. 1 and 2 only
 - B. 2 and 3 only
 - C. 1 only
 - D. 1, 2 and 3
 - Correct Answer : A
 - **Answer Justification :**

Statement 1: CORRECT The Social Stock Exchange was operationalized by SEBI in 2022 as

a separate segment within existing recognized stock exchanges (BSE and NSE). SEBI regulates it under the SEBI (ICDR) Regulations and SEBI (Listing Obligations) Regulations, with specific amendments for social enterprises. It is not a standalone exchange but a dedicated segment.

Statement 2: CORRECT Both categories are eligible. For-profit social enterprises (FPSEs) must demonstrate social intent as a primary goal and meet the eligibility criteria for social impact. Not-for-profit organizations (NPOs) must be registered as charitable trusts, societies, or Section 8 companies. Both must demonstrate primacy of social intent and meet minimum reporting requirements.

Statement 3: INCORRECT. Not-for-profit organizations cannot issue equity (they have no shareholders). NPOs listed on SSE raise funds through specific instruments designed for the non-profit sector: Zero Coupon Zero Principal (ZCZP) instruments, social impact funds, and donations through the SSE platform. For-profit social enterprises, on the other hand, can raise funds through equity, debt, or mutual fund routes. The statement incorrectly applies for-profit fundraising mechanisms to NPOs.

96. Consider the following features of PM-KUSUM:

1. Installation of standalone solar-powered pumps to replace diesel-powered agricultural pumps
 2. Solarisation of existing grid-connected agricultural pumps
 3. Installation of ground-mounted or stilt-mounted solar power plants on barren or fallow land of farmers
- How many of the above are components of the PM-KUSUM scheme?
 - A. Only one
 - B. Only two
 - C. All three
 - D. None

○ Correct Answer : C

○ **Answer Justification :**

Item 1: CORRECT. Component-B of PM-KUSUM provides for installation of standalone solar-powered agricultural pumps of up to 7.5 HP capacity in areas not connected to the grid or with unreliable supply, replacing diesel-powered pumps.

Item 2: CORRECT. Component-C provides for solarisation of existing grid-connected agricultural pumps, enabling farmers to use solar power for irrigation and sell surplus power to the DISCOM.

Item 3: CORRECT. Component-A provides for installation of small solar power plants (up to 2 MW capacity) on barren, fallow, or agricultural land as ground-mounted or stilt-mounted systems, allowing farmers to generate additional income by selling power to the grid.

97. The Popocatepetl Volcano, frequently seen in news due to volcanic activity, is located in which of the following regions?

- A. Central Mexico, between the states of Puebla and Morelos
- B. Northern Chile, along the Atacama Desert
- C. Southern Italy, near the Bay of Naples
- D. Western Indonesia, on the island of Sumatra

◦ Correct Answer : A

◦ **Answer Justification :**

Popocatepetl is one of the most active stratovolcanoes in Mexico, located in central Mexico near Mexico City. It lies between the states of Puebla, Morelos, and the State of Mexico and forms part of the Trans-Mexican Volcanic Belt.

Popocatepetl is situated in central Mexico, about 70 km southeast of Mexico City.

It lies on the Trans-Mexican Volcanic Belt, a major volcanic arc across Mexico.

It is a stratovolcano formed by subduction of the Cocos Plate beneath the North American Plate along the Middle America Trench.

Height: ~5,426 m (second highest volcano in Mexico).

One of the most active volcanoes in North America.

Located close to major cities like Mexico City and Puebla, making eruptions significant for hazard management.

98. Consider the following statements regarding the Global Risks Report:

1. The Global Risks Report is released annually by the Organisation for Economic Co-operation and Development (OECD).
2. The report assesses global risks across economic, geopolitical, environmental, societal and technological dimensions.

◦ Which of the statements given above is/are correct?

- A. I only
- B. II only
- C. Both I and II
- D. Neither I nor II

◦ Correct Answer : B

◦ **Answer Justification :**

Explanation

The **Global Risks Report 2026** released by the World Economic Forum identifies **cybersecurity threats as the most significant risk facing India in 2026**. At the global level, **gloeconomic confrontation** has been ranked as the **most severe risk**, surpassing both **armed conflict** and **climate-related threats**.

Statement I is incorrect. The **Global Risks Report** is published annually by the **World Economic Forum (WEF)**. The **OECD** publishes reports such as the **OECD Economic Outlook**, but it does not release the Global Risks Report.

Statement II is correct. The report evaluates risks across multiple domains including **economic, geopolitical, environmental, societal and technological risks**, highlighting interconnected global challenges such as **gloeconomic confrontation, climate risks, and societal polarisation**.

Thus, **only Statement II is correct**.

99. The manufacturing of Vanaspati Ghee from polyunsaturated vegetable oils involves which one of the following processes?

- A. Refining of oil
- B. Oxidation of oil
- C. Hydrogenation of oil
- D. Reduction of oil

◦ Correct Answer : C

◦ **Answer Justification :**

Explanation

Vanaspati Ghee is a hydrogenated vegetable fat used as a substitute for clarified butter (Desi Ghee). The process of converting liquid vegetable oil into a semi-solid fat involves a specific chemical reaction known as **Hydrogenation**.

- **The Chemical Process:** Vegetable oils (like soybean, groundnut, or sunflower oil) are **polyunsaturated**, meaning their fatty acid chains contain multiple double bonds ($C=C$). In the presence of a catalyst—usually **Nickel (Ni)**—hydrogen gas is passed through the oil at high temperatures.

Source- UPSC 2026 Geo-Scientist exam.

100. Consider the following description:

In certain experimental conditions, water that is initially at a higher temperature has been observed to freeze faster than water that starts at a lower temperature, despite the expectation that the hotter sample should take longer to cool before reaching the freezing point.

◦ Which one of the following phenomena is best described by the above statement?

- A. Leidenfrost Effect
- B. Mpemba Effect
- C. Supercooling
- D. Regelation

◦ Correct Answer : B

◦ **Answer Justification :**

Explanation

The statement describes the **Mpemba Effect**, a counterintuitive phenomenon in which **hot water may freeze faster than cold water under certain conditions**. The effect is named after **Erasto Mpemba**, a Tanzanian student who observed it in the 1960s while making ice cream.

Although the phenomenon seems to contradict basic thermodynamic expectations, several mechanisms have been proposed to explain it. These include **evaporation reducing the volume of water, stronger convection currents in hotter water, differences in dissolved gases, and variations in the extent of supercooling**. However, there is **no single universally accepted explanation**, and the effect depends strongly on the experimental conditions.

Other options refer to different physical phenomena. The **Leidenfrost Effect** involves a liquid forming a vapor layer when it contacts a very hot surface. **Supercooling** refers to a liquid remaining in liquid state below its freezing point. **Regelation** refers to melting of ice under pressure and refreezing when the pressure is removed.